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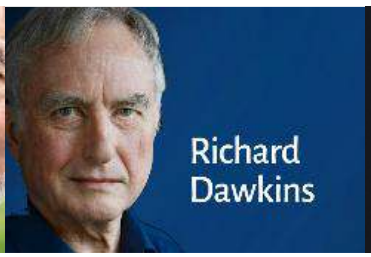

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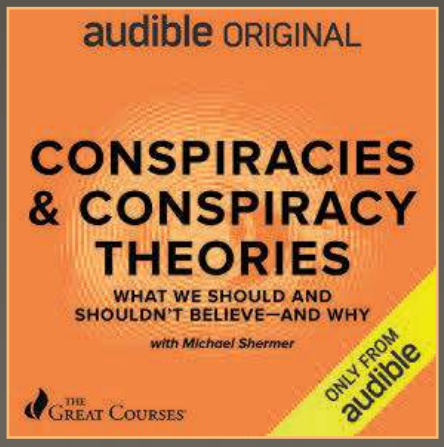

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Dr. Michael Shermer is the Publisher of *Skeptic* magazine, a Presidential Fellow at Chapman University, the host of the Science Salon podcast, and for 18 years a monthly columnist for *Scientific American*. His two TED talks, viewed nearly 10 million times, were voted in the top 100 of the more than 2000 TED talks. Dr. Shermer received his B.A. in psychology from Pepperdine University, M.A. in experimental psychology from California State University, Fullerton, and his Ph.D. in the history of science from Claremont Graduate University.

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The Skeptics Society is a nonprofit 501 (c)(3) educational organization that promotes science literacy and critical thinking, and investigates fringe science and paranormal claims. Supported by leading scientists, scholars, journalists and magicians, we

- publish science-based content in *Skeptic* magazine, *Junior Skeptic* (for kids), and *eSkeptic* (our free, weekly email newsletter)
- distribute *Skepticality* and *Monster Talk*, our free podcast
- sponsor a science lecture series at the California Institute of Technology and make recordings available in our online store
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- organize scientific conferences and events for research and educational purposes
- provide media with information on controversial claims
- maintain an educational website where one can find information on all of the above.

The Skeptics Society and *Skeptic* magazine investigate pseudoscientific and paranormal claims. With regard to statements, hypotheses, theories, and ideologies examined by the Skeptics Society, the organization adopts the view of the 17th-century Dutch philosopher Baruch Spinoza:

> "*I have made a ceaseless effort not to ridicule, not to bewail, not to scorn human actions, but to understand them*."

With regard to its procedure of examination of all claims, the Skeptics Society uses the scientific method first developed in the 16th and 17th centuries. While it recognizes the limitations and socio-cultural influences on science, it adopts the philosophy of Albert Einstein:

> "*All our science, measured against reality, is primitive and childlike—and yet it is the most precious thing we have*."

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The SkepDoc

The Fountain of Youth and Other Anti-Aging Myths

BY HARRIET HALL, M.D.

In St. Augustine, Florida, you can visit Ponce de León's Fountain of Youth Archaeological Park for an admission fee of $18.00. There, you can drink a sample of the miraculous water. You might even feel a bit younger… but only if you believe and are suggestible…or perhaps are just thirsty. This fountain may be of historical interest, but it is not of any therapeutic value.

A spring whose waters restore the youth of anyone who drinks or bathes in them is a myth that dates back to prehistoric times. Herodotus wrote about it in the 5th century BC. The Spanish conquistador Ponce de León was the first European explorer to reach Florida. The King of Spain had authorized him to lead an expedition to search for "the Islands of Benimy" and he originally mistook Florida for an island. He was not searching for a fountain of youth; that myth wasn't attached to his name until long after his death. But even if he had drunk of said fountain of youth, he'd still be dead.

Hope springs eternal, and history repeats itself. Today there are countless modern versions of the Fountain of Youth. Dietary supplements and other treatments are claimed to reverse the effects of aging and prolong life. Their promoters claim there is science behind them; in reality, they are just more myths. Centenarians share their secrets for a long life; they are all different. No treatment has ever been proven to keep humans young or make them live longer. Dr. Joe Schwarcz of McGill's Office for Science and Society said it best: "the science is all wet and drips with crackpot notions."[1]

What Happens to Our Bodies as we Age?

Many wines improve with age, but human bodies don't. We deteriorate with age. We develop wrinkles and gray hair, the skin thins and bruises more easily, vision and hearing decline and cataracts develop, blood pressure increases, bone density decreases, strength and agility decrease, the waist thickens, joints become arthritic, memory loss occurs, height may decrease by 1-2 inches, we learn and think more slowly, reaction time decreases, sexual functions change and hormone levels drop, and we become more likely to develop the diseases associated with old age such as cancer, diabetes, Alzheimer's, and heart disease. Psychologically, it's not all bad: the elderly have accumulated a vast store of life experience and general knowledge, sometimes but not always leading to wisdom. And believe it or not, older people tend to be happier.

As the World Health Organization explains, "At the biological level, ageing results from the impact of the accumulation of a wide variety of molecular and cellular damage over time. This leads to a gradual decrease in physical and mental capacity, a growing risk of disease, and ultimately, death."[2] Note the words "wide variety of molecular and cellular damage." It is simplistic to think any single intervention could reverse all of those different damages.

Insulin resistance is a sign of aging, and the diabetes drug metformin has been shown to extend the lifespan of mice and appears to rejuvenate *Caenorhabditis elegans*, a 1-millimeter roundworm, a nematode, more famously and elegantly known as *C. elegans*. Unfortunately, humans are not worms or mice.

A calorie restricted diet has reduced some biomarkers of aging in many species, such as primates, rats, mice, spiders, fruit flies, nematodes, and rotifers, but curiously it didn't work for house flies, and there's no good evidence that it works for humans. Even if it did, is maintaining yourself in a constant state of hunger a good trade-off for living longer? Lots of people apparently believe it is. There is even a Calorie Restriction Society International. Enthusiasts are reducing their calorie intake by 25% to 50%, which is unpleasant and impractical. Few people are willing or able to reduce their food intake by half, and there is concern that doing so might interfere with adequate nutrition. As the aging researcher Rozalyn Anderson quipped, "Life is difficult enough without engaging in some bonkers diet."[3] Intermittent fasting is more palatable, and it results in weight loss and health improvements. One popular version of this is to not eat for 12-14 hours after dinner—you get the 8 hours of sleep without thinking about eating (although you may dream about it), and if you can distract your attention from eating by doing other things for a few more hours, it's doable. More difficult are the longer stints of intermittent fasting, and it was found that even a five-day-a-month calorie restriction diet caused 25% of participants to drop out. Let's face it: people like to eat, and food is one of the pleasures of life that make life worth living.

Is Aging a Disease?

Aging is not an inevitable consequence for all life. There are some organisms that do not experience any decline in function as they get older, such as bristlecone pines. Lobsters don't develop any signs of aging; they just keep getting bigger. Greenland sharks live over 500 years and don't reach sexual maturity until they are 150 years old (that's a long time to wait!). Certain jellyfish are apparently immortal.

David Sinclair is an anti-aging researcher who has a new book out called *Lifespan: Why We Age and Why We Don't Have To.* He claims that aging is a disease that can be treated and even prevented. He foresees a future where people will live much longer (maybe even forever?) and will enjoy good health and vigor in old age. He provides an excellent overview of intriguing recent research findings. Sinclair puts his money where his mouth is and applies the findings to his own health regimen:

- He takes a gram each of NMN, (nicotinamide mononucleotide) resveratrol, and metformin daily.
- He takes vitamin D, vitamin K2, and 83 mg. of aspirin daily.
- He limits sugar, bread, and pasta intake, doesn't eat desserts, and avoids eating meat.
- He skips one meal a day.
- He gets frequent blood tests to monitor biomarkers; if not optimal, he tries to moderate them with food and exercise.
- He stays active, goes to the gym, jogs, lifts weights, uses the sauna and then dunks in an ice-cold pool.
- He doesn't smoke.
- He avoids microwaved plastic, excessive UV exposure, X-rays, and CT scans.
- He tries to keep environmental temperatures on the cool side.
- He maintains a BMI of 23-25.

He thinks it is working for him. He feels younger. Maybe he's right, but he admits "It's impossible to say if my regimen is working…but it doesn't seem to be hurting." Some of what he does has been studied and is known to improve health (exercising, not smoking, controlling weight) but much of it is based on speculation and hope.

His regimen reminds me of Ray Kurzweil, who explains in his book *Fantastic Voyage* how he combed the literature looking for anything that might allow him to live long enough for science to discover the key to immortality, which will then enable him to live forever. He gets frequent scans, cancer screens, and blood tests. He takes 250 pills a day: diet supplements like gingko and vinpocetine. He also takes several Chinese herbs. He spends one day a week in a clinic getting IV infusions of nutrients, IV chelation, and acupuncture. He meditates and gets massages. He had his mercury amalgam fillings removed, uses an ionic air filter, and follows a strict organic diet. He fears cell phones, shower water, electric razors, plastic, the aluminum in deodorants, and sugar. He claims that shiatsu and acupressure massage are intended to correct imbalances according to principles of energy flow between different organ systems in the body. He thinks water can record memories. Despite his research, much of what he advocates is not supported by the scientific evidence.

In my review of Sinclair's book[4] for Sciencebasedmedicine.org I explained why I found the research fascinating but didn't find his arguments entirely convincing. In my opinion, both Sinclair and Kurzweil are overly optimistic and too willing to forge ahead before the evidence is in. Kurzweil is 71 and Sinclair is 50. Time will tell. If they both live well past 100, I might have to eat my words; but then I'll probably die before they do. I'm 74 and have already lived longer than either of them—without the benefit of anti-aging remedies.

The Research is Intriguing

The research suggests that a loss of information may be the singular reason we age. Sinclair believes aging occurs when cellular damage activates our epigenetic repair mechanisms and they become overwhelmed: genes that should be on switch off (and vice versa) and chaos ensues. He invokes hormesis: a little stress is good for us, but too much stress causes aging.

Research has identified a number of longevity genes that could also be called vitality genes. Experiments in animals have demonstrated that modifying the activity of these genes can speed or slow the changes of aging and can prolong life. Some of the factors being studied: sirtuins, NAD (Nicotinamide adenine dinucleotide), rapamycin, TOR (target of rapamycin), NMN, the diabetes drug metformin, resveratrol, etc. Telomeres are a region of repetitive nucleotide sequences at the end of each chromosome: telomere shortening seems to play an important role in aging. Stem cells, genetic analysis, and new technologies are being studied. Mice given NAD became such enthusiastic runners that they broke the lab's treadmill. There are anecdotal reports of NMN restoring fertility in aged women and, again, lifestyle changes such as exercising, eating less, avoiding tobacco, intermittent fasting, avoiding obesity, etc. may help delay aging.

I would love to think humans could live many more years in good health and maybe even live forever. But I am skeptical. The scientific studies are promising but provisional; they are far from definitive. The history of science shows us that early positive studies are all too frequently reversed by subsequent larger, better studies, and unforeseen consequences are common. There are many anti-aging dietary supplements on the market, with enticing names like Life Extension and Ageless Body. They contain varying mixtures of vitamins, collagen and whey proteins, antioxidants, herbs, minerals, and even a sugar (D-ribose). They claim many health benefits, but most of the ingredients and mixtures have never actually been tested for clinically significant health benefits, much less for longevity. The Fountain of Youth is still a myth. S

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The Gadfly

How Would You Design a "Code of Conduct"?

BY CAROL TAVRIS

If you have attended a conference in the past decade, you undoubtedly will have been alerted to the sponsoring organization's Code of Conduct, detailing how you must behave, or what you must not do, or what other people must not do. Organizations are spending considerable time and effort to create Codes of Conduct meant to govern the behavior of their members at meetings. The codes try to specify precisely what behavior will evoke censure, if not ejection from the meeting (or even the organization).

Words matter. An organization's statement of its mission and values tells members which truths it holds to be self-evident. Yet once an organization tries to specify each and every one of the possible behaviors it wishes to prohibit (or encourage), it will find itself in linguistic and psychological quicksand. It's like telling a child not to eat the gumballs, muffins, or chocolates on the table, but failing to forbid the ice cream and pie. The overall concept—no sweets—is lost.

I had assumed that organizations produce codes of conduct to reduce the risk of being sued for harassment. "Look how we meticulously specified inappropriate behavior that will not be tolerated," they can say. But when Sarah Brookhart, Executive Director of the Association for Psychological Science, consulted their attorney, she was strongly advised against having any kind of such code or policy "because of the liability it creates." Brookhart told me that the code of conduct issue varies among science organizations. "For some it comes out of rampant harassment at their conferences," she wrote in an email. "For others it seems more symbolic than a response to an actual problem at conventions. I also think it reflects conditions for women in many academic departments." For example, she said, harassment is an especially serious problem for disciplines where women are very much the minority.

Consider two very different Codes of Conduct, which anchor the ends of the spectrum of approaches. One comes from the Society for the Scientific Study of Sexuality (SSSS) and its Sexual Harassment Task Force, which recently created a Statement of Values and Expectations, a Code of Conduct, and a set of procedures for handling violations of the code. When a draft of the document was sent to all members for their comments, president Eric R. Walsh-Buhi reported that "approximately half of those that responded wanted a *less* restrictive policy and the other half wanted a *more* restrictive policy." That alone might have made the board question the very plausibility of its efforts to specify every kind of behavior that all would agree is a "violation," but no. The final document, approved by the organization's Board of Directors and its attorney, is five single-spaced pages. The president acknowledged the length problem in his message to members, justifying it by asserting that "these documents have important legal implications," and therefore "must be as precise as possible to ensure that cases of reported misconduct are handled consistently, predictably, and fairly."

The SSSS statement starts with a list of "Aspirational behaviors," unenforceable but desired standards, which include (I am not paraphrasing):

- Be respectful and constructive when providing scholarly feedback or criticism.
- Be considerate of audience members' hearing and visual needs.
- Support respectfully-communicated dissent and alternative viewpoints.
- Keep an open, skeptical, and curious mind.
- Be welcoming and respectful to individuals of all ages, races/ethnicities, gender identities, sexual identities, religions, abilities, physical appearances, etc.
- Make efforts to talk to and include new attendees and those attending the conference alone.
- Be cautious about inviting individuals with less professional or institutional power…to private locations or to become inebriated with you, as they may not feel free to decline without repercussions.
- Use welcoming, respectful, and inclusive language. Examples of this include using the language that reflects what people call themselves, and using language that reflects all genders and sexualities.
- Intervene if you see harassment occurring …[e.g., create a distraction, butt into the conversation, report it to conference authorities.]

Next are "Expected behaviors," violations of which may simply involve (at least initially) asking the violator to quit it. Here I will paraphrase the central ones, which include, but are not limited to:

- Don't interrupt a speaker unless the speaker says that would be ok.
- Don't comment on people's bodies,

appearance, or sex appeal.
- Ask for consent before you hug or rub the back of anyone you don't know well or over whom you have power.
- Do not call people by gendered titles or pronouns unless they have directly disclosed their gender, and "do not call individuals by non-disclosed gender titles or pronouns." They have to tell you; you are not permitted to ask attendees about their sexual identity.
- Do not make generalizations about any "identity group" or make disparaging comments.
- Do not make "uninvited judgments regarding a person's lifestyle choices and practices, including those related to food, health, parenting, sex, and employment."
- People at SSSS will obviously talk about sexuality, but whereas it is fine to talk about the content of your sex research, do not ask attendees about their own sexual behavior.
- Don't get drunk, stoned, or high on anything "that might lead to interference with the scientific and social agendas."

How are you doing? Can you keep the "aspirational" standards separate from the "expected" ones? But now that you've gotten the point—that SSSS expects you to behave like a grown-up and not a rude, drunken boor—you get to the list of "prohibited behaviors, most of which are illegal":

- Repeatedly violating the "expected behaviors" *despite being asked to stop*.
- *Sustained and repeated* disruption during talks.
- Engaging in sexual behavior (e.g., kissing; touching the buttocks, breasts, or genitals; oral, anal, or vaginal sex) without the other person's consent.
- Physically threatening or stalking any attendee.
- Using violent language or threats of violence.
- Encouraging another individual to commit violence or engage in self-harm.
- Repeatedly photographing or recording someone without their permission.
- Repeated sexual flirtations, advances, or propositions that continue after the other person has communicated a lack of interest.
- Epithets, slurs, or negative stereotyping; threatening, intimidating, or hostile acts; jokes and display or circulation of written material or visual images that denigrate or show hostility or aversion toward an individual or group.
- Retaliating against someone who reports a violation of this code of conduct.

One long-time member of SSSS wrote to the board wondering why a professional Code of Conduct did not include other behaviors that annoy attendees. How about "no cellphones and texting during talks," "no unreadable power points," "no exceeding your allotted time and failing to leave time for the others in your symposium"? She added that while she appreciated "the efforts and good intentions behind this document," she was concerned about the proliferation of lengthy documents like this one. "It feels to me like a heavy cloak of moralistic finger-wagging rather than inviting more good work in a collegial atmosphere," she said.

Precisely. As a social psychologist, I wondered what this document specifies that the organization's members don't already know, and, more important, what effect it would have on anyone's actual behavior. As I read the SSSS Code of Conduct, I thought of how children react to all the finger-wagging "don'ts" that adults are forever telling them: "Don't hit your sister. Don't be a bully. Don't be greedy. Don't leave messes." How many say, "Ok, mom, I won't"? More likely, they continue the prohibited (but otherwise satisfying) misbehaviors and justify them: "I'm not a bully—he started it." "It's *her* fault." "*He* spilled the jam, not me."

Adults, as far as I can tell, are no different. Most sexists and racists deny that they are prejudiced; even Donald Trump, with his long-documented history of discrimination against African Americans, claimed that he is "the least racist person you've ever met." Will anyone recognize their own disapproved-of behavior? It would be like having a prohibition against being excruciatingly boring in your lectures and assuming that the worst bores would recognize themselves immediately and sign up for lecture-improvement-classes.

Moreover, notice how many of the prohibited behaviors are simultaneously specific and vague—quite an achievement in and of itself. They *sound* clear, but any psychologist would realize that human beings have an annoying tendency to disagree on their interpretation of any given act—and give the "rightness" of their own interpretation the benefit of the doubt. I'd like to be "welcoming and respectful" to you, a person from a different generation or country or ethnic group from mine, but what if my good intentions clash with your hypersensitive response? What if *my* cultural tradition is to greet a colleague with a kiss on each cheek or stand closer than most Northern Europeans like, and another person's isn't? Why am I the one who is automatically in violation?

At the other end of the spectrum from SSSS's code, here is what the board of the Society for Applied Research in Memory and Cognition unanimously approved:

> SARMAC is committed to being a friendly, supportive, and inclusive professional society, one in which everyone is treated with respect. We work hard so that our conferences deliver on that commitment. If your experiences during the conference fall short of our expectations, please speak with a member of the Governing Board, and we'll do what we can to help.

Couldn't have said it better, or more succinctly, myself. S

Apples and Oranges, Ants and Humans

The Misunderstood Art of Making Comparisons

BY MARK W. MOFFETT

Ants stake out territories, boldly gathering food even from our dinner plates, and rear their progeny in elaborate safe havens. Communicative, persistent, hardworking, battle ready, risk-taking, and highly organized, whether they are agronomists, herders, or hunter-gatherers, ants form elaborate labor forces of superb military operatives and diligent homemakers, masters at both protecting and providing for their colonies. Leafcutter ants, for one, have societies decidedly more complicated than any other nonhuman animal, and carry out mass-scale agriculture to boot.

Likening ants to people as I have just done can raise hackles—Edward O. Wilson, my mentor and the founder of sociobiology, has gotten into some trouble for it. The question is, can making comparisons go too far?

Comparing ourselves to other mammals comes easier, because we are mammals ourselves, as our hair, warm-bloodedness, and ability to lactate confirm. For all that, while watching a documentary on mammals, you likely won't find yourself exclaiming, *Eureka, they are so like us!* More often the differences strike us: quirks such as the fact that male elephants are outcasts—not members of any society at all, properly speaking. As for those relatives of ours—the chimpanzee and bonobo—how like them are we? Physically we resemble both apes, owing to a genetic closeness of the three species. But what of our social life? Most of the similarities that have been brought up bear more on broad facets of cognition than on the details of the apes' social organization we would otherwise think of as specific to people.

Those similarities are seldom as great or exclusive as they might seem. Insomuch as chimps and bonobos think as we do, the parallels often extend to other animals, too. Both are like us in recognizing themselves in a mirror; then again so do dolphins, elephants, and magpies. A claim exists, widely doubted, that ants do, too. At one time chimps were thought to be unique among nonhumans in making tools—employing twigs to snare termites is one example. Yet we know now of other toolmakers, such as woodpecker finches which

A very simple instance of a similarity to humans is shown by door-maker ants, *Stenamma alas,* which find a pebble of a suitable size to serve as the door to the colony entrance. In the left image an army ant has located the unprotected entrance; as soon as this enemy backs away, the guard ant within sticks her head out of the entrance to grab the pebble and move it into place (middle image). The image on the right shows the pebble blocking the doorway. Copyright Mark W. Moffett/Minden Pictures.

poke twigs to nab bugs. They can be socially manipulative; but then again so can just about any other social vertebrate, and especially other big-brained species such as the grey wolf and spotted hyena.

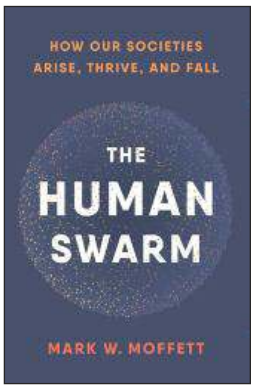
The fact is that though we share 98.7 percent of our genes with chimpanzees and bonobos, it's our differences that are most striking. Indeed, we are as different from them as apples are from oranges. In both apes, relationships are dictated by strict hierarchies of power, which are tyrannical in the chimp—especially in the males. On maturing, females of both species abandon childhood kith and kin for another community, never to return. The females are sexually receptive only on occasion, a condition made obvious by their swollen rear ends. The female chimp can pretty much either be beaten up or ignored by males except on the rare days she's in heat, at which point she often has sex forced on her. No wonder neither chimps nor bonobos have pair bonds or an extended family life, and mothers get little child support from dad—or anyone. Females aren't especially skilled at befriending each other, either; in fact a harried mother chimp must give birth at a private site to avoid having her baby killed.

So the social lives of other mammals can seem downright weird, if not altogether inhuman. And next to their weirdness is ours as mammals: No chimp has to grapple with the rules of a speedway or the upkeep of a homestead. Nor does it contend with traffic congestion, public health issues, assembly lines, complex teamwork, labor allocation, market economies, resource management, mass warfare, or slavery. As alien as insects seem to us in appearance and intelligence, only certain ant and human societies do such things, along with a few other social insects such as honeybees and some termites.

If you find comparisons of ants to people troubling, I confess to a glitch in my brain. The idiom *compare apples to oranges* confuses me. When I hear it I have to stop to think whether it's intended to signify that apples and oranges shouldn't be compared since they are so distinct; any botanist, for instance, will tell you one is in the rose family and the other is a citrus. Or does it mean they *should* be compared because they are so alike? Both are plant matter; both contain seeds, are round, reach a similar size, grow on trees, are fruit—the list goes on and on, so much so that in some languages the word for "orange" labels this fruit as a sort of apple.

But (I imagine someone protesting) no human hunters have ever caught prey in the way ants do, swarming and biting; and no human residence resembles one of their nests. So when are we justified in comparing an apple to an orange, or an ant to a human? American philosopher Nelson Goodman described the notion of similarity as "a pretender, an imposter, a quack." I'm sure he would have had equally bad things to say about differences. Any two things, apples and oranges among them, have innumerable characteristics in common and an equally immeasurable number of dissimilarities. What interests someone, similarities or differences, depends on that person's point of view. Identical twins aren't identical in the eyes of their mother; and the members of one race, though some outsiders may fail to differentiate among them, don't look alike to each other. If nothing else, remember this: comparing identical things is boring. For a scientist making comparisons bears most fruit when parallels are noticed between ideas or things or actions ordinarily treated as distinct, which makes ants, alien as they may be, prime candidates for our scrutiny.

People and ants reach different solutions to the same general problems, sometimes by using completely different approaches; but then again so can different human societies or different ant societies. Hence slavery in ants, where individuals work against their interests immersed in another society, is different from how Americans carried out slavery, which in turn differed from the treatment of those defeated in war by ancient Greeks. In some parts of the world, we drive on the left side of the road, in others on the right. On busy routes of Asia's marauder ants, incoming traffic streams down the highway center while outbound ants take its flanks, a three-lane approach no human city has tried. Both patterns bespeak the importance of getting goods and services to the right places safely and efficiently when the populace depending on them is enormous. The biblical King Solomon, a shrewd observer of nature, was right to admonish the reader to go to the ant, thou sluggard, consider her ways and be wise—though their flair for violence indicates that while we can indeed learn much from considering the ant, it's not always advisable to emulate them! S



Adapted from *The Human Swarm: How Societies Arise, Thrive and Fall*, by Mark Moffett. Basic Books 2019.

The Phantom Drone Scare

The Recent Spate of Sightings in the Midwest have Residents on Edge. One Explanation Can Be Ruled Out—Mass Hysteria

BY ROBERT BARTHOLOMEW

Since mid-December, there have been hundreds of reports of drones with unusually long wingspans flying in remote parts of Colorado, Nebraska, and Kansas, often in formation with other drones. The sightings have created such concern that the FBI has launched a Drone Task Force and is working with more than a dozen state and federal agencies. The flurry of mysterious drones crisscrossing the skies over the Midwest has attracted international media interest and spawned numerous conspiracy theories. It's the military. It's the CIA. It's a retired aviation expert with too much time on his hands. And of course, no explanation would be complete without the usual suspects: the Russians, the Chinese, Arab terrorists, and space aliens. But authorities are increasing looking to a surprising explanation: hysteria.

As an expert on this topic, I can categorically conclude that whatever the trigger for these sightings is, it is *not* mass hysteria. Commonly referred to in scientific circles as *mass psychogenic illness*, this term refers to the rapid spread of illness symptoms within what is typically a close-knit group. I am unaware of a single report involving people seeing drones and suddenly feeling unwell. Given the lack of concrete evidence for drones and the identification of several objects that were clearly not drones, there is a much more likely explanation: what sociologists refer to as a collective delusion. Unfortunately, there is a lot of misinformation surrounding the term because of the word "delusion," which is commonly used by psychiatrists and psychologists to describe people who are experiencing psychosis and having trouble telling the difference between fantasy and reality. They may exhibit visual or audio hallucinations or create complex stories that have little basis in fact. However, when sociologists use the term collective delusion, they are usually referring to incidents involving the spontaneous spread of false beliefs within a given population.

If this were a horse race, based on the evidence compiled thus far, *Social Delusion* would be the clear early favorite. There are many examples of collective delusions in recent history. One famous episode occurred in Ireland during the mid-1980s, when groups of people began flocking to religious grottoes following reports that statues were moving. The episode began on February 14, 1985, when several schoolchildren thought they had witnessed a miracle. One of the witnesses, 7-year-old Elizabeth Flynn, said: "I saw Jesus moving. His hand moved and he called me." Other pupils said they could not only see the beckoning hand, but the eyes were moving as well. This dramatic incident received sensational media coverage and soon people began flocking to the church to confirm or deny the "miracle." Before long thousands of people were reporting that they too could see the statues moving. Many assumed it was a sign from God. Over the next several months, thousands of people began visiting churches across the region and staring at the statues with the expectation that they might "give them a sign." Newspapers and media outlets could not keep up with the deluge of reported

miracles that were claimed to have occurred in at least 40 separate locations. Psychologist Jurek Kirakowski of Cork University concluded that the sightings were the result of optical illusions prompted by intense staring at the statues, particularly at dusk.[1]

Scientists collect facts and form hypotheses. Sometimes they can not draw a conclusion with any certainty. The case of the mystery drones is one such instance. While we wait for more information to emerge, or a physical object to examine, what we can say based on a perusal of the facts is that a social delusion is the most likely explanation. Could someone or a group be experimenting with drones in the rural countryside of the Midwest? Certainly, but most of these sightings appear to be the result of misidentifications or other mundane explanations. Investigations by everyone from the Colorado Department of Public Safety to the Federal Aviation Administration and the FBI have failed to turn up any concrete evidence of anything out of the ordinary. In mid-January, the Colorado Department of Public Safety (CDPS) issued a press release on the status of their investigation. They reported that from November 23 to January 13, they received 90 reports of mysterious drones. Not a single instance of illegal drone activity was confirmed, and of the 14 cases involving hobbyists, none of the drones had large wingspans or were flying in clustered formation as had been reported. Of the 23 more recent reports, six were determined to have been prompted by atmospheric conditions or commercial aircraft, while 13 were identified as "planets, stars or small hobbyist drones not meeting the description of large wingspan drones traveling in groups." Only four of the reports fell into the category of "unable to identify."[2]

Instead of dismissing ongoing public anxiety of the sightings, the CDPS has stated that while they are unaware that any crime has been committed or anything out of the ordinary is going on, they will continue to monitor the situation. This was a wise move because instead of dismissing the reports entirely or ridiculing witnesses, by openly sharing their investigation results with the public, and showing a willingness to look at any new cases as they arise, and maintaining an open dialogue with the public, they have likely tamped down the growth of rumors and conspiracy theories which continue to swirl around this topic.

In assessing this case, it is important to remember that eyewitness testimony is notoriously unreliable. This could be a case of history repeating itself. From the late 1940s to the early 60s, the United States experienced numerous flying saucer sighting waves. In the early years, their appearance coincided with the advent of the Cold War, resulting in the popular belief that they were a secret foreign device, most likely Russian. Few people thought they were space aliens.[3] More recent UFO sighting clusters have tended to be interpreted in a more benevolent manner, as "saviours from the skies" or what Carl Jung termed as "technological angels."[4] Many of the early "space brother" reports of the 1950s involved human-like beings assuring earthlings that they were here to protect us from the ravages of the Atomic Age (also the theme of the 1951 science fiction classic film *The Day the Earth Stood Still*). For many believers, it was a reassuring message. The sky has always served as a Rorschach ink blot test of the collective unconscious, reflecting popular hopes and fears.

Hundreds of years ago, lonely sailors peered out to sea and saw voluptuous mermaids beckoning to them from distant shorelines. During the 19th century, sea serpent sightings were common, as were fairy reports. One could argue that these phenomena have never left us, and that they keep reappearing in a different form, colored by culture and the times. Is it possible that flying saucers and UFOs have morphed into something more plausible—and current—the fear of foreigners and new technologies. Several people have posted online that the drones may be Iranian terrorists plotting future attacks. And while we need to take threats seriously, any assessment needs to be based on evidence, and right now, there is none.

I have studied the history of outbreaks of UFO sightings over the US since the 1890s and there is a familiar pattern. First is the historical backdrop. We are living in a period of significant geopolitical tension combined with the relatively recent advent of high functioning drones. Add to this mix the unprecedented level of government distrust and the fallible nature of human perception, and you have a recipe for a phantom drone scare as people scrutinize the skies either to confirm or to deny the rumors. In doing so, they are prone to redefining ambiguous, almost exclusively nocturnal aerial stimuli as the product of sinister forces. If true, it would not be the first time this has happened—and it certainly won't be the last. **S**

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Why People Believe Conspiracy Theories

BY MICHAEL SHERMER

This essay is derived from Lecture 1 of a 12-lecture course titled "Conspiracies and Conspiracy Theories: What We Should Believe and Why" produced by the Teaching Company and Audible.com.

On Friday, March 15, 2019 a 28-year old Australian man wielding five firearms stormed two mosques in Christchurch, New Zealand, and opened fire, killing 50 people and wounding dozens more. It was the worst mass public shooting in the history of that country, prompting Prime Minister Jacinda Ardern to reflect: "While the nation grapples with a form of grief and anger that we have not experienced before, we are seeking answers."

One answer may be found in the shooter's rambling 74-page manifesto titled *The Great Replacement*, apparently inspired by a book of the same title by the French author Renaud Camus. The Great Replacement is a right wing conspiracy theory that claims that white Christian Europeans are being systematically replaced by people of non-European descent, most notably from North Africa, Sub-Saharan Africa, and the Arab Middle East, through immigration and higher birth rates.

The New Zealand killer's name is Brenton Harrison Tarrant and his manifesto is filled with white supremacist tropes focused on this conspiracy theory, starting with his opening sentence "It's the birthrates" repeated three times. "If there is one thing I want you to remember from these writings, it's that the birthrates must change," Tarrant insists. "Even if we were to deport all Non-Europeans from our lands tomorrow, the European people would still be spiraling into decay and eventual death." Tarrant then cites the replacement fertility level of 2.06 births per woman, complaining that "not a single Western country, not a single white nation," reaches this level. The result, he concludes, is "white genocide."

This is classic 19th century blood-and-soil romanticism, and the self-described "Ethno-nationalist" Tarrant writes that he went on this murderous spree "to ensure the existence of our people and a future for white children, whilst preserving and exulting nature and the natural order." His screed goes on and on like this, culminating in a photo collage of attractive white people and well-armed militia men.

It is reminiscent of the "Unite the Right" event in Charlottesville, Virginia, in August of 2017 when white supremacists shouted slogans like "blood and soil" and "Jews will not replace us." Given that there are only about 15 million Jews in the world, Judaism employs no missionary effort at conversion, and birthrates among Jewish families are among the lowest in the world, why would any group worry about being "replaced" by them? They're not. They're reflecting the conspiracy theory that Jews control the media, politics, banking and finance, and even the world economy.

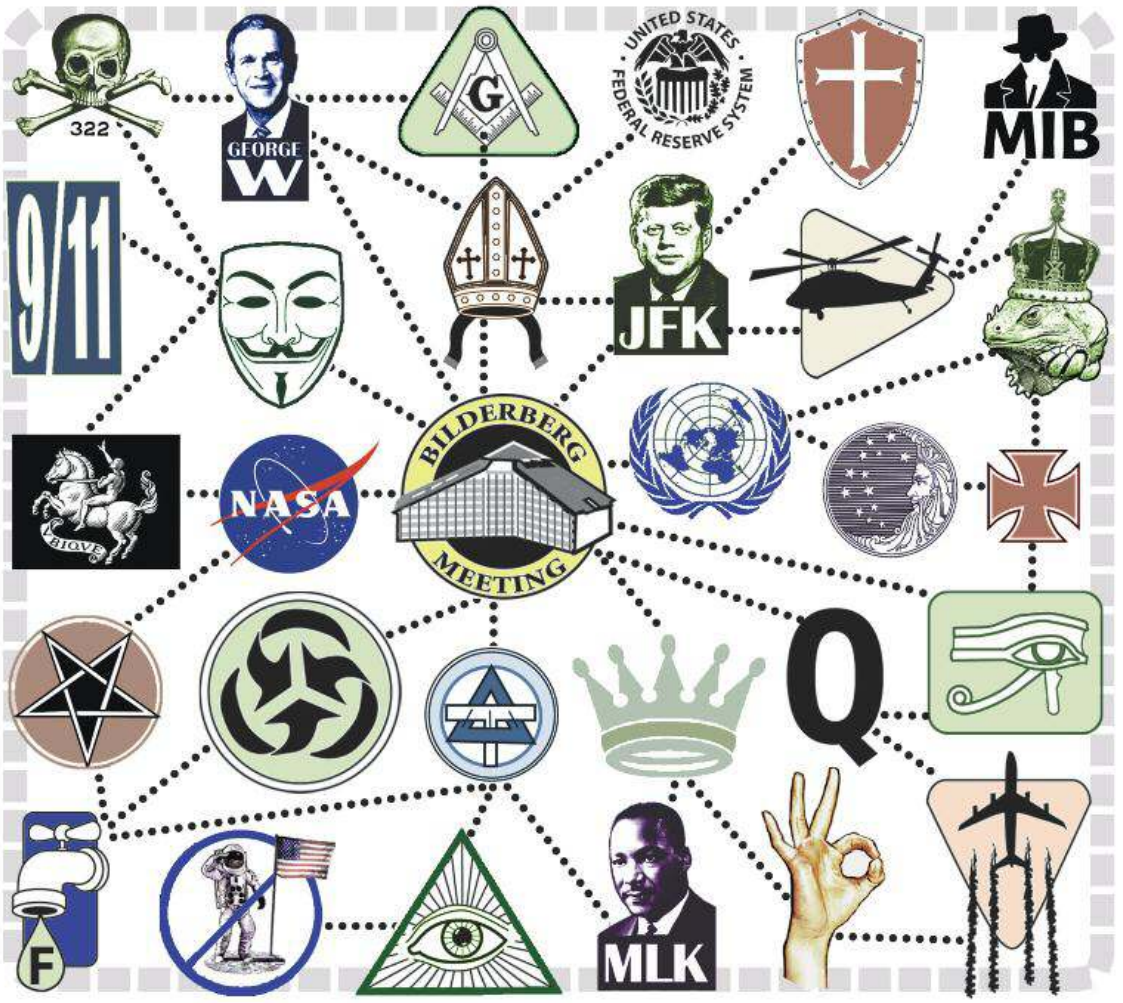
In his manifesto Tarrant references the number 14, or the fourteen-word slogan originally coined by the white supremacist David Lane while in federal prison for his role in the 1984 murder of the Jewish radio talk show host Alan Berg. Here are the 14 words:

> "We must secure the existence of our people and a future for white children."

The number is sometimes rendered as 14/88, with the 8s representing the eighth letter of the alphabet—H—and 88 or HH standing for Heil Hitler. Lane, in fact, was inspired by Adolf Hitler's conspiracy-theory laden book *Mein Kampf*, in which the Nazi leader rants:

> What we must fight for is to safeguard the existence and reproduction of our race and our people, the sustenance of our children and the purity of our blood, the freedom and independence of the fatherland, so that our people may mature for the fulfillment of the mission allotted it by the creator of the universe.

Hitler goes on to identify the enemy of his mission—the Jews—which reflects another conspiracy theory called the "stab in the back," popular in



Germany in the 1920s and 1930s. According to this theory, the only reason the Germans lost World War I was that they were stabbed in the back by the "November Criminals" (the Armistice was signed on November 11, 1918), who the Nazis insisted were Jews, Marxists, and Bolsheviks.

And this "stab in the back" conspiracy theory itself derives from an earlier and larger conspiracy theory involving *The Protocols of the Learned Elders of Zion*, a hoaxed document purporting to be the proceedings of a secret meeting of Jews plotting global domination. A number of prominent people at the time believed the *Protocols* hoax, including the American industrialist Henry Ford, who published his own conspiratorial tract titled *The International Jew: The World's Foremost Problem*. He later recanted and withdrew the book from circulation when he found out the conspiracy theory was a fake.

What all this shows is the power of conspiratorial belief to motivate people to act, including murderous action, from killing dozens in New Zealand to murdering millions in the Holocaust.

* * *

Conspiracy theories are as countless as they are confusing. I once met a politician who told me that he believes the fluoridation of water is the greatest scam ever perpetrated on the public. I have been confronted by 9/11 "truthers" who have insisted the al-Qaeda attack was actually an "inside job" by the Bush administration. Others have regaled me for hours with their breathless tales of who really killed JFK, RFK, MLK Jr., Jimmy Hoffa, or Princess Diana, along with the nefarious goings-on of the Federal Reserve, the New World Order, the Trilateral Commission, the Council on Foreign Relations, the Committee of 300, the Knights Templar, the Freemasons, the Illuminati, the Bilderberg Group, the Rothschilds, the Rockefellers, and the Zionist Occupation Government (ZOG) that secretly runs the United States. It would take Madison Square Garden to hold all the conspiracists plotting world domination.

But what is a *conspiracy*, and how does it

differ from a *conspiracy theory*? I define a *conspiracy* as two or more people plotting or acting in secret to gain an advantage or to harm others immorally or illegally. I distinguish a conspiracy from a *conspiracy theory*, which I define as a structured belief about a conspiracy, whether it is real or not. A *conspiracy theorist*, or *conspiracist*, is someone who holds a conspiracy theory about a possible conspiracy, again whether or not it is real.

Although the terms "conspiracy theory", "conspiracy theorist," and "conspiracist" do sometimes carry pejorative connotations meant to disparage someone or their beliefs—as in "that's just a crazy conspiracy theory" or "he's one of those nutty conspiracists"—the terms in fact have a rich history not meant to disparage.

Who believes in such conspiracies? Surveys by the political scientists and conspiracy researchers Joseph Uscinski and Joseph Parent show that conspiracists "cut across gender, age, race, income, political affiliation, educational level, and occupational status." For example, both liberals and conservatives believe in conspiracies at roughly the same level, although each thinks different secret cabals are at work, with liberals more likely to suspect that media sources and political parties are pawns of rich capitalists and corporations, while conservatives are more likely to believe that academics and liberal elites control these same institutions.

There are other factors at work as well. Race, for example, is not a predictor of overall conspiracism, but it does partially determine which conspiracy theories are likely to be embraced. African Americans, for example, are more likely to believe that the federal government invented AIDS to kill Blacks and that the CIA planted crack cocaine in inner city neighborhoods to ruin them. By contrast, white Americans are more likely to suspect the Feds are conspiring to abolish the Second Amendment and convert the nation into a socialist commune.

Education appears to attenuate conspiracy thinking, with 42 percent of those without a high school diploma scoring high in conspiratorial predispositions compared to those with postgraduate degrees, who come in at 22 percent. Nevertheless, that one in five Americans with postgraduate degrees believe in conspiracies tells us something else is going on here.

In my 2011 book *The Believing Brain* I suggested that two cognitive processes are at work in conspiracy thinking: (1) *patternicity*, or *the tendency to find meaningful patterns in both meaningful and meaningless noise*, and (2) *agenticity*, or *the tendency to infuse patterns with meaning, intention, and agency*. I will explore these concepts in more depth in another lecture, but the idea is that the pattern-detection filters of conspiricists are wide open, thereby letting in any and all patterns as real with little or no screening of potential false patterns.

Conspiracy theorists connect the dots of random events into meaningful patterns, and then infuse those patterns with intentional agency, and believe that these intentional agents control the world, sometimes invisibly from the top down, instead of the bottom-up causal randomness that determines much of what happens in our world.

To these factors we can add three *cognitive biases* that often distort events and evidence to fit our preconceived conspiratorial conceptions. For example, the *confirmation bias* is the tendency to seek and find confirming evidence in support of already existing beliefs, and to ignore or reinterpret disconfirming evidence. Once you have decided that a conspiracy theory is true, your brain sets out to find evidence to support it and filter out evidence that doesn't.

Another is the *hindsight bias*, in which we tailor after-the-fact explanations to what has already happened. Once an event has occurred, we look back and reconstruct how it happened, why it had to happen that way and not some other way, and why we should have seen it coming all along, the very essence of conspiracism.

Then there's *cognitive dissonance*, the phenomenon of mental tension created when someone holds two conflicting thoughts simultaneously, such as what happens when conspiracy theories about the end of the world don't come true—instead of admitting their mistake believers double down on their belief and rationalize the failures, all in an attempt to reduce dissonance.

Anxiety, alienation, and feelings of rejection are also factors in conspiratorial cognition. For example, in 2017 Princeton University researchers had subjects write a brief description of themselves that they then shared with two other people in their small group, telling them that they would be judged by the other group members. The subjects who were told that they were rejected were more inclined to believe in conspiracy-related scenarios.

And it's not just private anxieties. Cultural anxiety may also lead to conspiracy thinking. A 2018 survey of over 3,000 Americans, for example, found that those who reported feeling that American values are eroding were more likely to

agree with conspiratorial statements, such as "many major events have behind them the actions of a small group of influential people."

Feeling in control or powerful in your environment reduces anxiety, but the opposite—concern about what may be out of your control can increase anxiety and conspiratorial paranoia about things that could go wrong. In a 2015 study conducted in the Netherlands, for example, researchers divided subjects into three groups: (1) those primed to feel powerless and out of control, (2) those primed to feel in control and powerful, and (3) a control group not primed for anything. The subjects were then told about a construction project undergoing problems that could be related to a conspiracy by the city council to steal money from the project's budget. Subjects primed to feel powerless and out of control were more likely to believe the conspiracy theory. Researchers have also found that conspiratorial speculation runs higher after natural disasters like earthquakes, or when people fear that they may lose their job.

* * *

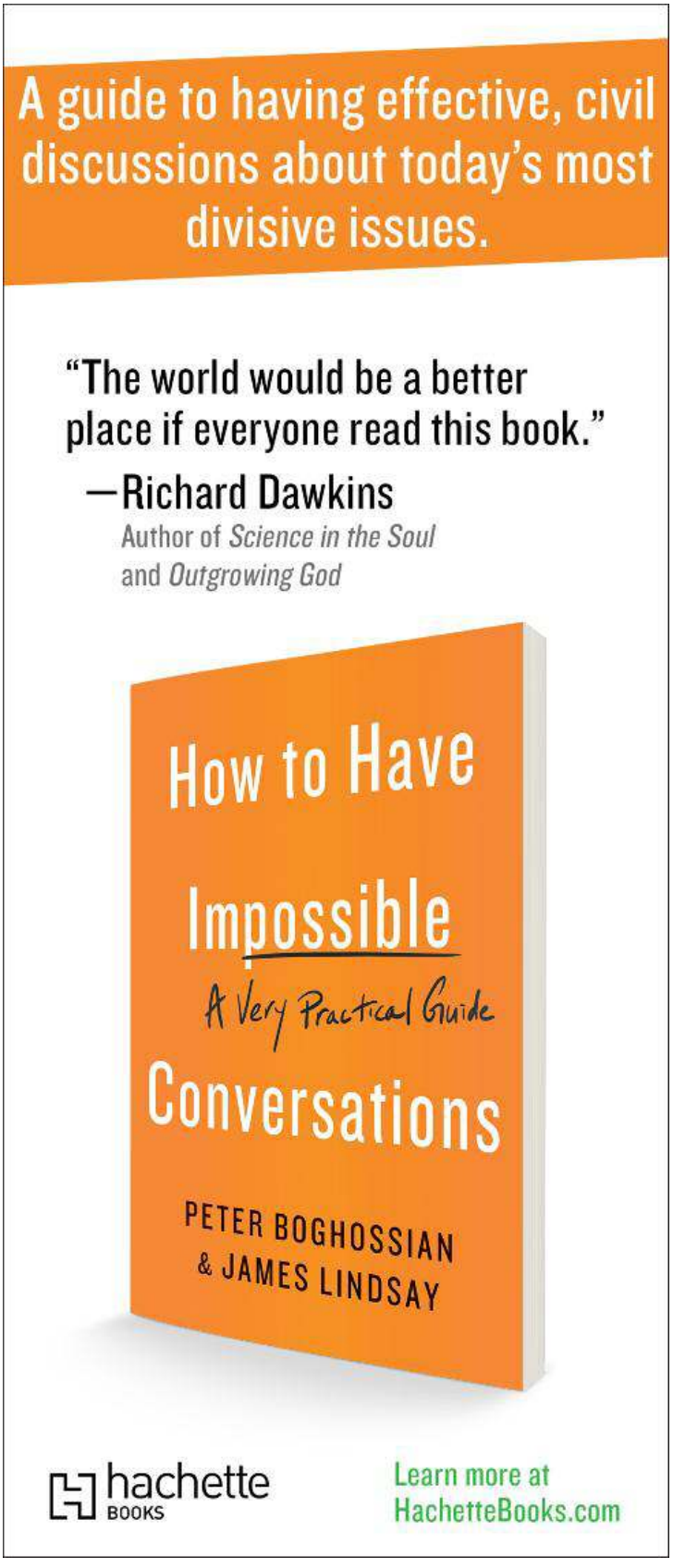
There is another reason why people believe in conspiracy theories that researchers have largely neglected: a lot of them are true. Enough conspiracies are real that it pays to be constructively paranoid because sometimes "they" really are out to get us.

If we take the *Oxford English Dictionary's* definition of a *conspiracy theory* as "a belief that some covert but influential agency (typically political in motivation and oppressive in intent) is responsible for an unexplained event," then even a cursory review of history reveals that conspiracies have dramatically influenced the course of history and may still be found at work in modern societies. Consider some examples.

Julius Caesar was stabbed to death by a conspiracy of Roman senators on the Ides of March in 44 B.C.E.

The Gunpowder Plot of 1605 saw a group of provincial English Catholics attempt to assassinate King James I by blowing up the House of Lords during the State Opening of Parliament. The plot was discovered and thwarted days before, with the conspiracists caught, tried, convicted, hanged, drawn, and quartered.

In 1776 an elite group of soldiers were assigned to be George Washington's bodyguards, some of whom were plotting to assassinate the future first president of the United States at the behest of the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governor of New York and the Mayor of New York City. The plot was foiled, thanks only to the ineptitude of the plotters to keep a secret.

Abraham Lincoln was assassinated by a conspiracy of Southerners angered by the outcome of the Civil War, which itself was instigated by a Southern cabal to illegally secede from the United States—arguably the biggest conspiracy in U.S. history.

World War I exploded after a Serbian separatist secret society called the Black Hand conspired to assassinate the Austrian archduke Franz Ferdinand, leading to an arms race that erupted in the guns of August and the start of a conflict that resulted in the deaths of millions.

The Japanese sneak attack on Pearl Harbor was, by definition, a conspiracy that the U.S. military and intelligence agencies failed to detect, leading to conspiracy theories that President Roosevelt let it happen on purpose to drag America into war.

The obsessively paranoid Joseph Stalin wasn't conspiratorially-minded enough to realize that Hitler was plotting to break their nonaggression pact and invade the Soviet Union, despite warnings from the British government to that effect. The consequence was the deaths of tens of millions of soldiers and civilians.

In the 1950s, with his now-infamous Congressional hearings, the conspiratorially minded Senator Joseph McCarthy launched a witch hunt to ferret out what he claimed was a Communist conspiracy to destroy America.

In the 1960s, Operation Northwoods was a document produced under the Kennedy administration that proposed a number of "false flag" operations that might be carried out in order to justify military intervention in Cuba. Among the proposals were such ideas as staging a fake attack on the U.S. military base at Guantanamo Bay, employing a fake Russian MiG aircraft to buzz a real U.S. civilian airliner, faking an attack on a U.S. ship to make it look like Cubans did it, and developing "a Communist Cuban terror campaign in Miami." None of these crazy ideas were implemented, but that members of Kennedy's administration considered them—even in the context of a meeting with people just spitballing ideas willy nilly—reveals the lengths to which even high ranking people in the government are willing to conspire against others to get their way.

In the 1970s, Watergate stands out as a conspiracy of dunces, and the Pentagon Papers revealed the extent to which the Kennedy, Johnson, and Nixon administrations conspired to escalate the Vietnam war without Congressional knowledge, much less approval. And we now know that Kennedy conspired to have Fidel Castro assassinated, Johnson conspired to cover up that fact when he took office, and Nixon secretly recorded conversations in the Oval office that revealed his distinctive view of presidential power—a view that he later summarized in an interview with David Frost as follows: "Well, when the president does it, that means that it is *not* illegal."

In the 1980s, the Iran-Contra arms-for-hostages scandal was a conspiracy that embodied what conspiracists since World War I had been concerned about—the usurpation of power by conspirators who were legally elected to their positions instead of hijacking government agencies through a coup, which was common in centuries past.

In the 1990s, government overreach against Randy Weaver and his family in Ruby Ridge, Idaho, and against David Koresh and the Branch Davidians in Waco, Texas, understandably led to the rise of the conspiratorially-minded militia movement that culminated in Timothy McVeigh's bombing of a federal building in Oklahoma City.

In the 2000s, the George W. Bush administration concocted a conspiracy theory that Iraq was developing weapons of mass destruction as a justification for invading that country, which proved false when inspectors failed to find any WMDs. And Wikileaks revealed the extent to which the NSA and other governmental agencies conspired to spy on Americans and foreign leaders on the heels of 9/11. As Buffalo Springfield cautioned in their 1966 hit song *For What It's Worth*, "There's something happening here. What it is ain't exactly clear."

In the 2010s, as if the run-up to the 2016 Presidential election wasn't crazy enough, in the middle of it, and continuing after Trump's victory, there emerged a bizarre conspiracy theory at Trump rallies were some of his supporters held signs reading "Q" and "QAnon." It apparently began with an internet user called "Q Clearance Patriot" or "Q," who posted on internet message boards like 4chan and 8chan the conspiracy theory that inside the "deep state" there is an "anonymous" source working against the Trump administration. "I can hint and point but cannot give too many highly classified data points," the Q conspiracist wrote, adding: "These are crumbs and you cannot imagine the full and complete picture." That complete picture apparently includes such operatives as Hillary Clinton, Barack Obama, George Soros, and

various Hollywood celebrities, all alleged to be involved in a global sex trade and pedophile ring.

The "Qincidences" (spelled with a Q) include the recurrence of certain numbers, such as 17 (Q is the 17th letter) and 4, 10 and 20, corresponding to DJT, or Donald J. Trump. And since "there are no coincidences" in the mind of the conspiracist, such numerology led to the absurd 2016 "Qonspiracy theory" (also spelled with a Q) of "Pizzagate". Promulgators of this theory asserted—without any evidence and beyond belief—that Hillary Clinton was directing a pedophile ring out of a pizza parlor. As absurd as this sounds, the Pizzagate conspiracy theory led a young man to shoot up a restaurant with an AR-15-style rifle, claiming he intended to break up the perceived perversion. It was fortunate no one was hurt in the incident, but it revealed the power of conspiratorial paranoia.

As we approach the 2020s a new type of conspiracism has been identified by the political scientists Russell Muirhead and Nancy L. Rosenblum in their 2019 book, *A Lot of People are Saying: The New Conspiracism and the Assault on Democracy*. Classic conspiracy theories are grounded in arguments and evidence, whereas more recent conspiracy theories are simply asserted, usually without facts to support them. This new conspiracism is captured in the book's title, ripped from the 2016 presidential election and Donald Trump's recurrent phrase "a lot of people are saying," which was typically followed by no evidence whatsoever for the assertion. As Muirhead and Rosenblum explain the new conspiracism:

> There is no punctilious demand for proofs, no exhausting amassing of evidence, no dots revealed to form a pattern, no close examination of the operators plotting in the shadows. The new conspiracism dispenses with the burden of explanation. Instead, we have innuendo and verbal gesture: "A lot of people are saying …" Or we have bare assertion: "Rigged!" … This is conspiracy theory without the theory.

How then does such conspiracism spread and catch hold? Repetition. In the age of social media, what counts is not evidence so much as retweets, re-posts, and likes. And by no means is the new conspiracism the product only of President Trump, given that politicians—not to mention economists, scholars, pundits, and ideologues of all stripes—have been making evidence-lacking assertions for generations, although admittedly without an audience of 60 million twitter followers the current conspiracist-in-chief commands.

More importantly, Trump's conspiratorial assertions would go nowhere without a receptive audience, so the blame for the nefarious effects of the new conspiracism have to be spread much wider to encompass all of social media, alternative media, and even some mainstream media, which have stepped up their sensationalistic headlines in an effort to recapture advertising dollars they've been losing since the rise of the Internet.

* * *

Individuals act on their beliefs, and when those beliefs contain conspiracy theories about nefarious goings-on, those acts can turn deadly. That is exactly what happened at the Tree of Life synagogue in Pittsburgh on October 27, 2018, when an assailant armed with guns and one of the oldest conspiracy theories about the Jews running the world, murdered eleven congregants before his capture. "I just want to kill Jews," he proclaimed.

Consuming content on the online social network Gab, the conspiricist grew paranoid about the Hebrew Immigrant Aid Society (HIAS), which the Tree of Life synagogue helped support. On Gab the conspiracist read that HIAS provided aid to the migrant caravans moving north from Central America toward the United States' southern border. "HIAS likes to bring invaders in that kill our people," the assassin posted on Gab just before he committed the mass murder, adding "I can't sit by and watch my people get slaughtered. Screw your optics, I'm going in."

This brings us back to the mass murder in New Zealand with which we began this lecture. These are just two of countless conspiracy theories with real-world consequences, mostly bad. Ideas matter. Beliefs matter. Conspiracy theories matter. And they are not confined to the fringes of pop culture or the dark web, but instead penetrate all areas of public and private life, often directing the lives of people and the course of history.

So as we analyze examples like these in the lectures ahead, I hope you'll reach the same conclusion that I've reached: The subject of this course—conspiracies and conspiracy theories—could well be one of the most important subjects any of us can study. **S**

Note: Dr. Shermer's 12-lecture course can be purchased on Amazon or Audible.com under the title "Conspiracies and Conspiracy Theories: What We Should Believe and Why."

Biological Beauty

An Adaptive Illusion

BY VICTOR S. JOHNSTON

"And as much as I'd like to believe there's a truth beyond illusion, I've come to believe there's no truth beyond illusion. Because between 'reality' on the one hand, and the point where the mind strikes reality, there's a middle zone, a rainbow edge where beauty comes into being."

—Donna Tartt, *The Goldfinch*, 2013

For most people, selecting a mate is a complex multifaceted decision of paramount importance for their future happiness. It is the stuff of great novels and plays, comedies and tragedies, filled with pleasure or fraught with pain. Given the high stakes involved in this life-changing decision it is both strange and remarkable that an apparently trivial attribute, physical beauty, should play such a prominent role. Our common sense tells us that physical beauty is merely a personal whim ("beauty is in the eye of the beholder") or a frivolous quality ("beauty is only skin deep") that we should ignore ("don't judge a book by its cover"). Despite these admonitions, however, beauty is not ignored. Indeed, the enhancement of beauty has spawned several multi-billion dollar international businesses: the cosmetics industry, cosmetic surgery, and advertising. It appears that individuals are willing to invest a great deal of time, money, and effort in the pursuit of this ephemeral attribute. So perhaps there is more to beauty than meets the eye.

Beauty does not exist in the external world. Like all human feelings it's an internal subjective experience that only exists in the mind of a conscious observer. Nevertheless, these transitory mental experiences are an integral part of our lives. We strive for happiness, cry with pain, love our children, feel sorrow at the death of a friend, and cherish the pleasures of passionate love. It's remarkable that we attach so much importance to these inner feelings given that they are not real objects in the physical world, like hearts or kidneys. We cannot hold feelings in our hands, look at them, hear them, or directly measure them. However, despite their volatile and transitory nature, we treasure our feelings because they add value to the physical objects and events in the world around us; without them our lives would be dull, pointless, and robotic. But where do our feelings come from? Certainly no one has to, or could, teach another human being what hunger, sweetness, anger, pain, or jealousy feel like, for they are part of our nature. Throughout our lives new events or circumstances can evoke such feelings, but the feelings themselves are part of our biological inheritance. But how could a feeling like beauty evolve, what is its function, and how does it influence the brain of a human observer? These are the questions we must address to uncover the mystery of this enticing experience.

In a previous article in Skeptic, "Darwinian Goggles," I used the metaphor of car race to illustrate how mental attributes, such as sensations and feelings, could evolve over generations and ultimately modify the structure of the human brain. The race involved self-driving cars built from a collection of components that possessed intrinsic properties such as brittle glass, volatile gasoline, malleable metal, hard pistons, soft tires, acidic batteries, etc. However, when these parts were assembled in the appropriate manner they produced cars that possessed novel emergent properties such as "acceleration," "cornering ability," and "noisiness," that were not present in the components themselves, but were a product of the arrangement and interactions among many different components. A group of these cars was then entered into a recurrent sequence of races. After each race new cars were constructed based on slight variations of the design of the prior race's winners. The outcome of these races was used to illustrate the effects of evolution over generations.

It is the emergent properties, such as acceleration and cornering ability, that determine which cars are winning, and it is these same functional attributes that are being enhanced over generations. A nonfunctional attribute, such as noisiness, may well disappear from future cars. By analogy, over generations natural selection favoring mental properties that enhance reproductive success will inevitable modify and refine the structural organization of the brain that gives rise to those attributes. In an evolutionary paradigm, function dictates structure, so selection favor-

ing functionally useful conscious discriminations (e.g., redness or roughness) and evaluative feelings (e.g., beauty or bitterness) will continually both refine and enhance these attributes and, at the same time, modify the neural structures and processes that generate these experiences.

If we look inside the engine of a car we are not going to find an emergent property like acceleration, because it only exists as an extrinsic property that depends on the coordinated interactions of many spatially distributed parts. However, this coordination requires a precise timing signal so that fuel injections, electrical sparks, etc. occur at the precise time that each piston reaches its top dead center position. These observations are also true for the emergent properties of a biological brain. We are not going to find a conscious experience like beauty in a brain, but we should expect to find a temporal mechanism that coordinates the neural activity and binds together the distributed processes that ultimately evoke this evaluative experience in a human's mind. But before examining this neural response we need to establish that physical beauty is indeed a functionally useful feeling that enhances reproductive success.

Although physical beauty appears to be a minor factor in human mate selection, it plays a major role in other sexually reproducing species. Testosterone mediated mating dances, melodic songs, and displays of brightly colored iridescent tails are some of the lures employed by males to seduce members of the opposite sex. Hormone mediated fertility signals such as chest blisters, labial swelling, or face reddening are common enticements displayed by other female primates. Females use such signals to attract males, and those males who are attracted by such cues certainly enjoy reproductive benefits. What do human males find attractive in females? To address this question male students were asked to generate their most beautiful female face using a computer-simulated evolution (a genetic algorithm). By rating female faces (phenotypes) generated from binary strings (genotypes) that crossed over and mutated between generations, the male students evolved attractive facial composites that were consistently different from the average female face (*Figure 1*). Specifically, the attractive female face had larger lips and eyes and a shorter, narrower chin than the average. Like other female primates, these attractive features have a hormonal origin.

Young boys and girls enter puberty with almost identical proportions of muscle, fat, and bone, but they rapidly mature into reproductive adults with very different body shapes and compositions. These anatomical changes are, to a large degree, controlled by steroid hormone levels. Under the influence of estrogens, a young woman gains about 35 pounds of fat, changing the size and shape of her breasts, hips, thighs, and lips. In contrast, a young man acquires about one and half times as much muscle and bone mass, regulated by the complex action of androgens (and aromatized androgens) acting both directly and indirectly (through release of growth hormone) on bone and muscle tissues. As a result, the adult male's face has a longer and broader lower jaw than that of a female, and the growth of brow ridges results in more sunken narrow eyes. From this hormonal perspective, attractive female faces are displaying physical features indicative of higher than average levels of pubertal estrogens (full lips) and lower levels of androgen exposure (short narrow chin and large eyes).

In artificial insemination studies (to control for sperm quality), this combination of hormones has

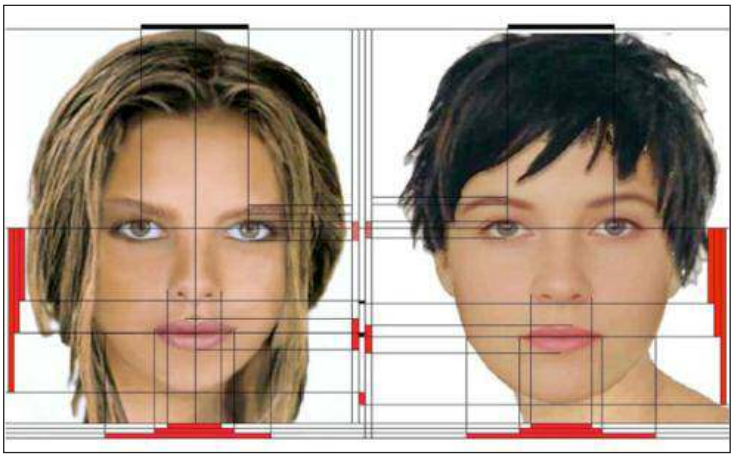

Figure 1. Differences between attractive (At) and average (Av) female faces.

Figure 2. Attractive male and attractive female faces.

also been shown to be associated with both the "hourglass" shape of a female's body (a 0.7 waist to hip ratio) and higher than average fecundity. In the absence of contraception, female fecundity reaches its maximum in the mid-20s, declines by about 20% in the mid-30s, and then falls precipitously by a further 60% during the 40s. The thinning of a female's lips parallels these steep declines in fecundity and it is not uncommon for females to use lipstick or collagen injections to maintain or enhance their facial attractiveness. Taken together, these observations suggest that the physical beauty of a human female's face depends on the display of highly visible hormonal markers that are indicative of higher than average fecundity.

Any facial characteristic that enhances biological survival will increase in frequency over generations as a consequence of natural selection. For example, in a cold dry climate a long nose with thin nostrils that can warm and add moisture to the air would be an adaptive trait, whereas a short nose with wide nostrils would be adaptive in a tropical environment. So in any breeding population these average facial features should evolve over generations because they are the most adaptive traits for survival in the local environment. Sexual selection is a form of natural selection, but it has a different modus operandi. In sexually reproducing species, sexually selected traits are attributes of one sex that enhance access to the opposite sex or offer a competitive advantage over members of the same sex. These traits are mediated by sex hormones and can be in the form of bird songs or conspicuous tails or tusks that are displayed by members of one sex or the other. Viewed from this perspective, in any local breeding population the average female face is certainly attractive but the most attractive faces display the additional hormone mediated sexually selected traits that serve as markers of higher than average fecundity (see *Figure 1*). Such displays would be ineffective, however, if they didn't evoke an emotional response in the brains of male admirers. This hypothesis has been evaluated by recording *event related potentials* (ERPs) from human males exposed to brief presentations of facial images of the opposite sex.

ERPs are obtained by measuring the changes in voltage recorded from different scalp electrodes during the one-second interval following the presentation of a stimulus. When the waveforms collected from each electrode are averaged over a number of presentations of the same stimulus the averaged ERP reveals the spatial and temporal pattern of the neural processes evoked by that stimulus. The averaging procedure enhances the consistent effects evoked by the stimulus relative to the variable background activity, thus improving the signal to noise ratio. The early components of ERPs vary with the physical attributes of a stimulus, such its intensity, color, or modality, but the later components are correlated with more general attributes such as the probability of the stimulus or its value to the observer.

One of the most studied late components is the third positive wave (P3) that is characterized by its maximum amplitude in parietal electrodes and a latency of 300 to 600 milliseconds, depending on the complexity of the stimulus. It has been well established that low probability stimuli evoke larger P3 waves than high probability events. That is, if an improbable low pitch tone is embedded within a long sequence of identical high pitch tones (an odd ball paradigm) the P3 evoked by the low probability tone is much larger than that evoked by high probability tone. However, when subjects are presented with a random sequence of two equally probable stimuli (tone or light) but asked to predict which one will occur on any trial, the P3 is always larger to the stimulus that disconfirms, rather than confirms, their prediction. That is, the amplitude of the P3 is really a function of the observer's subjective probability, not the computed objective probability. Simply stated, surprising events evoke a larger P3 than expected events.

A second factor that influences the P3 amplitude is the value of the stimulus to the observer. Cognitive psychologists define the value of a stimulus as its "task relevance" whereas biological psychologists define value as the inherent or learned "emotional value" of a stimulus to the observer. In my "Darwinian Goggles" article I suggested that pleasant and unpleasant feelings are an evolved inherent value system that defines external objects or events as threats or benefits to reproductive success. Objects, such as money, can acquire value by virtue of their learned association with these fundamental rewards and deterrents. This interpretation of value has been supported by a number of experiments that systematically examined ERPs evoked by biologically-relevant stimuli that consistently evoked pleasant or unpleasant feelings in human observers.

As a first step, this experiment involved rating a large number of pictures on a five-point scale that ranged from very unpleasant to very pleasant. The ratings were then used to construct three non-overlapping categories (most pleasant, neutral, most unpleasant), with 4 slides in each category. The content of these categories was babies, ordinary people, and dermatological slides that displayed faces with severe skin diseases. Two additional four-slide categories were constructed based on pictures that received different pleasantness ratings from males and females.

Their content was playboy or playgirl models; one rated highly by males and lower by females (female models) and the second rated highly by females and lower by males (male models). These five emotional categories (B, P, D, FM and MM) were then used in a series ERP studies designed to manipulate "emotional value" while "task relevance" was held constant.

One large study involved two groups of subjects: one group (10 male, 10 female) was required to predict the category of a slide (B, P, D, FM or MM), whereas the second group (10 male, 10 female) was instructed to simply count the total number of different emotional pictures. ERPs were recorded after every slide presentation. First of all, in agreement with prior studies, the only P3 difference between the two groups was due to disconfirmed predictions evoking larger P3s than confirmed predictions, in the predicting group of subjects. All of the other results were directly related to the emotional value of the stimuli. For all subjects, the P3 amplitude evoked by the pleasant (B), neutral (P) and unpleasant pictures (D) formed a U shaped function, with pleasant and unpleasant slides evoking larger P3s than the neutral slides. Furthermore, for male subjects the playboy models (FM) evoked a larger P3 response than male models (MM), whereas in female participants the P3 was larger for the MM than the FM category. Since all stimuli were equally probable and task relevant within each group, these findings are compelling support for interpreting P3 amplitude as an index of emotional value. This conclusion provides a solid foundation for using P3 amplitude as a measure of the emotional response of human males when they are exposed to female facial images that vary in features and proportions.

Computer software was used to generate 64 facial images (32 male, 32 female). The configuration of the 32 female faces was based on prior studies that established the average (Av) and the attractive (At) features of five facial components (*Figure 1* illustrates these differences). All combinations of female faces possessing one of two possible eye sizes (Av and At), two jaw widths (Av and At), two lips sizes (Av and At), and two chin lengths (Av and At), were generated. The two hair types (black/blond) were arbitrary. For control purposes, 32 male facial images were also constructed based on all combinations of the same set of facial components, but now using the average male features and proportions, as well as male faces modified in exactly the same manner as that used to produce attractive female faces. ERPs were collected from 25 male volunteers during three experimental sessions. During each session the participants were only instructed to focus on each of the 64 slides as they were presented in a random order. In a final session, the participants were required to rate each face for its degree of attractiveness.

This study revealed that the amplitude of the P3 component of ERPs recorded from the male participants was highly correlated with their attractiveness ratings of the female, but not the male, faces. Most remarkably, out of all the many possible combinations of male and female features and proportions, the largest P3 response was evoked by female faces displaying the combination of larger than average lips and a shorter narrower chin. As noted earlier, this combination of full lips (a marker of high estrogen levels) and a short narrower chin (a marker of low androgen levels) has been shown to be associated with high fecundity. So from a biological perspective, it appears that adult females, not unlike other female primates, are continuously displaying highly visible facial cues that are capable of evoking an emotional response in the brain of male observers.

Over the course of human history, discriminating ancestral males who were attracted by such cues undoubtedly enjoyed more reproductive success than non-discriminating males. This is the functional value of facial beauty. In some respects, however, beauty is like the sweetness of sugar. Throughout our hunter-gatherer history this rich source of ATP was only obtainable from ripe fruit or honey. But in the modern world, with sugar refineries that separate the sugar from its nutritional source, the sweet taste of sugar is no longer a reliable index of a healthy diet. Similarly, in the modern world, artificial insemination, contraception, plastic surgery, and fertility drugs, have all significantly reduced the validity of beauty as a reliable index of fecundity. Nevertheless, just like sugar, it will probably continue to enchant and allure humans for some time to come. S

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EXCERPT

Monopoly and Monopolies

What Board Games Teach Us About Capitalism and How to Modify It

BY JONATHAN KAY

Imagine that you are in the late stages of a game of *Monopoly*, battling it out against a lone remaining opponent. You each control a bunch of expensive properties, all loaded with hotels. Both of you also are cash-poor, with no spare properties left to mortgage. Every roll of the dice carries high stakes. If your opponent lands on one of your hotels, the only way he can pay the rent will be to sell off his own hotels at a 50-percent discount (because that is how the rules of *Monopoly* work), and vice versa. This means that the first player who lands on an opponent's hotel will not just lose a lot of money: He will also lose the assets he needs to earn that money back. In real life, the analogy would be the poor worker in Victorian Britain who, unable to pay a small debt, goes to debtor's prison, which further compromises his ability to earn a livelihood, and so pushes his family deeper into complete destitution.

"Well, that's capitalism," you might say. Perhaps. We will get to that later. For now, I want to emphasize that this aspect of *Monopoly*—the poor get poorer, while the rich get richer—is not only typical of laissez-faire economics. It is also characteristic of a certain dynamic observed in nature, engineering, and human relationships, one that mathematicians sometimes describe as unstable equilibrium.

Take a simple physical metaphor: a marble resting at the bottom of a salad bowl is going to exhibit a *stable* equilibrium—because small movements in any direction will push the marble up against the walls of the bowl, and the marble will roll back toward its start position, also known as its equilibrium point.

If the salad bowl is turned upside down, however, and the marble is placed at the top of it, the marble will exhibit an *unstable* equilibrium: Even if the marble is balanced perfectly on top of the bowl, and so remains temporarily motionless, a nudge in any direction will lead to a feedback loop whereby the marble rolls off the bowl, moving slowly at first and then accelerating downward. In general, a stable equilibrium tends to correct itself, restoring the balance of offsetting forces that held it in check to begin with; while an unstable equilibrium tends to destabilize in one direction or another, until the system in some way collapses or reaches a different stable equilibrium.

Now let us return to *Monopoly*. You and your imaginary opponent are moving your tokens around the board, seeking to avoid one another's hotels. In a

way, you each inhabit an economic state analogous to the marble sitting on top of that salad bowl. All you need is a single initial nudge toward poverty and a cascade will begin, pushing you further and further down.

Monopoly is not the only game in which this kind of phenomenon plays out. The same thing happens in chess: If your opponent blunders away a bishop or a rook, she not only has one fewer pieces available to attack your king, she also has one fewer pieces available to defend her remaining pieces. It becomes more likely that one of those other pieces will also be lost, and then another, and another, until her side collapses completely. This is why expert chess players sometimes will resign a game after losing just a single pawn—because they know that top-flight opponents will exploit any tiny advantage so as to create larger and larger advantages, until the game ends in a rout. This is why chess is such a tense game.

Stability theory has enormous real-world ramifications. As an engineer in the 1990s, I spent a lot of my time figuring out how to ensure that the systems I designed, whether software or hardware, would not go haywire if they were nudged in one direction or another. In some cases, solutions can be obvious and low-tech. Remember those old toys called Weebles? The reason "Weebles wobble but they don't fall down" is that the toy's weight is bottom-loaded. Similarly, a sailboat in a windstorm also can exhibit a stable equilibrium: The more the wind pushes the sailboat to one side, the less sail height is presented to the wind, meaning that less rotational force is applied to the boat—a true self-correcting system (within certain environmental limits).

But in other cases, ensuring stability in an engineering system requires high-tech methods. Think of a Segway scooter, a system that, like a marble sitting atop an inverted bowl, very much looks like it should collapse if nudged from the front or the rear. (Some engineers call it the "inverted pendulum" problem.) The system achieves stability only through the ingenious use of hidden electric motors, gyroscopes, and tilt sensors.

I went through a period of life when I was fixated on the nature of dynamical systems—including the chaotic dynamical systems represented by certain forms of fractal geometry, which I discovered through James Gleick's groundbreaking 1987 book, *Chaos: Making a New Science*. It is a rich area of mathematical modeling that I am giving only the most superficial treatment in this text. But you do not have to be a mathematician or engineer to appreciate the way certain systems gravitate toward either stability or instability. All you have to do is play board games.

Imagine, for instance, a game in which there was a built-in stabilizing mechanism that actually penalized a player for being in the lead? Well, guess what: I just described the "robber" in *Catan* (formerly known as *Settlers of Catan*), a popular game in which players compete to create networks of resource-gathering "settlements" on a modular hexagonal map-board. Of course, there is no rule that says the robber has to be placed in a way that targets the winning player. But that is what usually happens (except when the winning player herself is repositioning the robber), since everyone has a built-in incentive to take down the player closest to victory. In this way, the game mechanics are the opposite of those at work in *Monopoly*: They are designed in a way that helps underdogs instead of penalizing them.

Similarly, in the epic 1970s-era war game *Civilization*—in which ancient armies seek the domination of Eurasia—the losing player gets the benefit of moving her troops last in any game turn (a huge strategic advantage, since you can see what everyone else is doing before you commit to your own strategy). And in the popular German game *Power Grid*, in which players compete to build power-generation networks, the losing player gets to bid first on available fuel sources, when they are cheapest. Think of these elements as the gameplay equivalent of the sensor-driven motors in a Segway that push back against gravity and keep the thing from falling over.

It is not hard to see how *Monopoly* could be retrofitted in the same stability-encouraging way. Indeed, the game already has a few stabilizing elements such as the Community Chest card that reads "You are assessed for street repairs: pay $40 per house and $115 per hotel you own." There is another version of this card in the Chance deck that assesses costs for houses and hotels at $25 and $100 respectively. Both of these cards greatly penalize players with lots of houses and hotels, but do little to harm the interests of a player with few assets.

If you wanted to make a more "stable" version of *Monopoly*, all you would have to do is add a lot more cards like this to the decks, and perhaps increase the assessed amounts. You could also stipulate that the person who draws this card does not pay the assessed fees to the bank, but instead pays it to the player with the fewest houses and hotels. Or you could make it progressively more expensive for players to buy houses and hotels depending on how many houses and hotels they already own. Or you could stipulate that the winning player does not get $200 every time he passes Go. I could provide more examples, but you get the picture: These rules all serve to add a stabilizing dose of the-rich-get-soaked or the-poor-get-a-helping-hand to

the game's naturally unstable rich-get-richer dynamic.

Of course, what I am describing here is not just a way to fix *Monopoly*. It is a way to fix one of the basic problems with capitalism as we now experience it in the era of globalized winner-take-all commerce. A hundred years ago, a successful store owner could put other store owners in his neighborhood out of business. In 2020, Amazon and Alibaba are pushing whole bricks-and-mortar retail *sectors* into bankruptcy on a global level. Meanwhile, Google and Facebook are vacuuming up the lion's share of web advertising. As *The New Republic* reported in late 2018, monopolies now penetrate almost every economic sector: "Two companies make 64 percent of American diapers; one company builds 52 percent of America's mobile homes; two companies produce 78 percent of its corn seeds; and one company assembles 61 percent of syringes."

As many economists have noted, the resultant income inequality is not just a threat to egalitarian ideals. It is a threat to capitalism itself, since the health of the free market always will depend on a viable middle class that supplies both demand and labor to a mass-retail economy. (Poor people do not have enough money to buy much. And the super-rich spend a very small percentage of their income on goods and services.)

A game of *Monopoly* ends when one player has all the money and everyone else is bankrupt. But a human society is not something that you fold up and put back in the box. It is not supposed to *end*. So you need a way to stabilize the economic dynamic, to make sure the rider doesn't fall off the Segway, to keep the marble on top of the upside down salad bowl. Otherwise, you get depressions, financial crises and even revolutions.

Critics of capitalism often decry the "greed" that animates successful entrepreneurs. The real problem, however, is not the amount of money made by people at the top; it is the systematic suppression of people at the bottom. The real-life equivalent of the *Monopoly* player who has to mortgage all his money-making assets to pay his debts is the hand-to-mouth day laborer who, unable to pay his car insurance, loses his car and, unable to drive to his job, is unable to pay his rent. The villain here is not necessarily the avarice of the banker who loaned this poor fellow his money in the first place. It is the unstable dynamic of a system that mercilessly drives some people down to the bottom through a succession of cascading misfortunes.

To experience the board game version of this kind of misery vortex in *Monopoly* is to appreciate the advantages of the welfare state, which, when it is functioning properly, doesn't just redistribute money from rich people to poor people. It also softens the iterative feedback dynamics within the system so as to ensure that minor nudges—a lost job, a criminal conviction, a divorce, a medical setback—do not create feedback effects that ultimately produce a full-blown personal catastrophe. Job training, public health care, a humane criminal justice system, community housing, and support for single mothers are examples of programs that can achieve that effect.

* * *

It has been almost thirty years since I devoted myself to the academic examination of stability theory and dynamical systems. Regardless, it is the sort of subject that, once studied, can never be forgotten. And this kind of analysis continues to color every aspect of my outlook on life—including the way I think of the future of our species.

Consider climate change, perhaps the most important issue facing the planet. One of the reasons why climate modeling is so complicated is that our climate is, on at least one level of analysis, an unstable dynamical system that, if pushed hard in one direction (say, by massive surges in atmospheric carbon dioxide concentrations) can cause a cascade of feedback effects that compound the initial perturbation, and send the whole atmosphere into a radically different equilibrium state.

Understanding the nature of these "feedback effects" is critical if we are to understand the threat. To take one example, a warming earth causes glaciers to melt, thereby decreasing the amount of surface snow and ice that reflect solar radiation back into the atmosphere. Thanks to this sort of positive feedback mechanism, a warmer earth keeps getting warmer, melting more ice, absorbing more solar radiation and so on, until Miami Beach is chest-deep in water.

Or consider war, that ancient scourge of human civilization. "Firepower and heavy defensive armament—not merely the ability but also the desire to deliver fatal blows and then steadfastly to endure, without retreat, any counter-response—have always been the trademark of Western armies," wrote Victor Davis Hanson in his 1989 classic, *The Western Way of War: Infantry Battle in Classical Greece*. The reason why these ancient battles typically were so decisive—"a single, magnificent collision of infantry," as Hanson described the archetype—is that the brand of warfare waged by Greek phalanxes (and, later, Roman maniples) often exhibited the same fundamentally unstable equilibrium you see in chess, even when the adversaries were, at the dawn of battle, evenly matched.

When soldiers lost their nerve because an aspect

of the battle initially went poorly, or because they were surrounded by a flanking maneuver, they sometimes would turn and flee, progressively throwing the soldiers around them into greater states of confusion and terror, and exposing everybody to complete slaughter. This domino effect was on bloody display at Adrianople, for instance, in 378 CE, when Gothic cavalry surrounded and hacked to death a larger force of Roman troops, thereby accelerating the fall of the Western half of the empire. Something similar happened six centuries earlier, at Cannae, where 50,000 Carthaginian troops commanded by Hannibal massacred a force of 86,000 Romans almost to the last man. In the first two years of World War II, the German army performed roughly analogous feats of arms by using columns of blitzkrieging tanks to encircle and successively defeat Polish, French, and Russian defenders.

This helps explain why these conflicts are such popular themes for war games. Unstable battle dynamics tend to produce exciting, dramatic results. World War II, with its highly kinetic battles, has inspired more war games than any other war. Indeed, the 1942 Battle of Stalingrad alone (which ended with the encirclement and massacre of the German Sixth Army) has been the subject of at least 70 published board game titles.

Compare this with World War I, which is a relatively rare subject for board game designers. The reason is obvious: The hyper-stable trench warfare dynamic that governed the conflict makes gameplay predictable and boring. In World War II, the availability of massed tanks and air power meant that an attacker could apply enormous striking power in a way that could easily overwhelm an enemy's localized defenses. In World War I, on the other hand, the reliance on trenches and machine guns created the opposite dynamic: Many attacks resulted in hideous casualties for the attacker and few for the defender. Any perturbation to the battlefield dynamic would usually end with a reversion to the status quo.

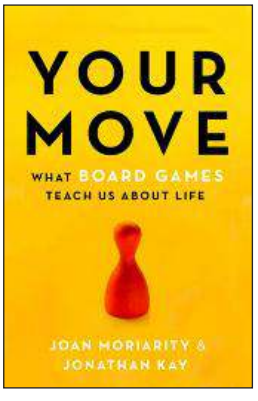
Does this suggest some sort of simple, linear relationship between battlefield dynamical instability and gaming fun? No, because at some point, a military dynamic becomes so unstable that it does not really lend itself to any satisfying form of recreational simulation. It is notable, for instance, that hyper-modern forms of warfare, especially those involving standoff missile systems or nuclear payloads, are not particularly popular themes among war gamers. If you can annihilate whole countries with the push of a button, the game becomes a simple race to see who can push the button first. There have been some good games produced on the Cold War theme (such as *Twilight Struggle*), yet these tend to avoid the apocalyptic military aspect and instead focus on espionage, geopolitics, diplomacy, trade, and technology.

In gaming, as in some parts of life, there is always going to be a sweet spot between perfectly stable and perfectly unstable system dynamics. The rich-get-richer aspect of *Monopoly* may produce bitterness and social friction. But on the other hand, no one would want to play a perfectly socialistic version of the game, in which all income is distributed equitably, no one ever goes bankrupt, and the game never ends. Likewise, a real-life economy in which there are no winners and no losers would not work because, as 20th-century experiments with communism have showen us, an economy in which hard work yields no personal benefits is an economy in which no one does hard work.

* * *

Board games take inspiration from real life. That does not mean they always reflect the values and preferences we exercise in our real-life capacities as workers, family members, friends and political actors. Some of us may be drawn to the cutthroat dynamical instability of *Monopoly* because it makes for exciting game play, while also recognizing the fact that real life has to follow different rules because humans have more complex and urgent needs than game tokens.

Even so, the dynamics that govern *Monopoly* can help us understand how much of the character of our societies is embedded in—and dictated by—the dynamical feedback processes encoded in our economy and laws. If you want to improve the moral character of a society, you do not necessarily have to change the way people think and feel. Sometimes, all you have to do is fiddle with the rules that govern what happens every time they pass Go. S



This essay was adapted with permission from *Your Move: What Board Games Teach Us About Life*, by Joan Moriarity and Jonathan Kay, published in 2019 by Sutherland House. $17.95. 180 pp. ISBN-13: 978-1999439545

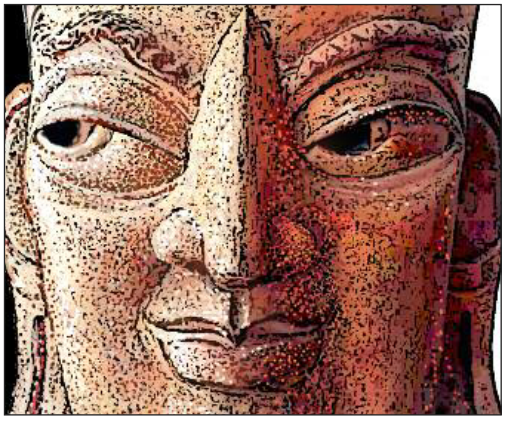
Meditation as Ideology

BY KATHY SCHULTHEIS

Most of you reading this have tried meditation. And many of you have been successful. I do not write for you. I write to seek clarity. So, you who are devotees of this ancient discipline, please stop reading. I write for those, who, like me, tried to meditate and failed. For those of you who washed out, who ceded your minds to worry, you told yourself that you were not self-disciplined, that you didn't do your breathing exercises, that it would have worked if you had just kept at it. So you tried again, and you failed again. And you gave up… wistfully, I assume, because you believed and still believe that there was something there to get but you just couldn't access it. And so you are mad, mad at yourself, not at it, "the practice," as those who can meditate call it. Why couldn't you do this? You couldn't get your mind to shut down, right?

Have you ever considered this: that you *were* successful, indeed too successful, that you caught a glimpse of something and what you saw there in that desert place was nothing, and so you fled seeking to return to the "kingdom of bang and blab?" I had a number of such unsettling encounters while meditating, and they engendered in me something akin to the terror I experienced in the demon-haunted world of my Irish-Catholic girlhood. It seemed to me I stood by the Iron Gate leading to hell. I will never go back there again, but I think it might be therapeutic, indeed exorcistic, to share two of my experiences.

Caveat Emptor: I am the product of 12 years of painful Irish Catholic indoctrination, which I have spent a lifetime trying to shake off. To erase the crown of thorns with the Buddha's smile seems somehow irreconcilable with my identity. We shall see in what follows if there are any of you who felt there—in that empty place—what I felt, what Emily Dickinson described when spying the serpent in the garden: "zero at the bone."



I took up meditation last year because I was depressed, more than usual, by dark thoughts. I was encouraged by friends, all who have derived benefit from meditation and its close cousin, mindfulness. Perhaps it would be better, one friend suggested, to give up worry. Give up worry? I'm Irish. The two—worry and "troubles"—are the corn beef and cabbage of the Irish soul. How to give up a habit of mind that is a legacy, a sign of cultural continuity, one that is inscribed in every Irishman's genetic code? Still, I decided to try.

Like most people, I had little success at first. I couldn't empty my mind. I couldn't silence the voices in my head. All I could hear was white noise, until I didn't. One day I heard nothing. The white noise vanished, and I experienced it—the blankness of not thinking. It took me by surprise—this feeling of not being—and it is impossible now to reconstruct the terror I felt. I find myself fleeing to moments in literature where a character experienced something like I did, the most famous, of course, being *The Heart of Darkness or* Ishmael's experience of the "whiteness of the whale" in *Moby-Dick*. When the practice of "not thinking" lifted, I began to think, and I began to feel, and what I felt was dark and inexpressible. I felt hollowed out, as though dwelling in a state of complete absence, separate, and completely alone. Gasping for breath, I ran from my home screaming into the night. Outside at midnight, I looked about and realized that all was the same: the suburban street upon which I live was as dull and featureless as

always, and I stumbled back to my door and fell into a restless sleep in which Sister Mary Agatha, mouthing the word "forever," watched me descend into the flames of hell.

After this, I was quite certain I would meditate no more. There is no prospect, I considered, more terrifying than nonexistence. I would never do this again. As the days passed, my insomnia, which had responded not at all to meditation, got much worse. Sleepless and anxious, I decided to go once more unto the breach. Someone recommended that I listen to Sam Harris, and so I put his "Waking Up" app on my phone. Each night I tuned in to Harris's calm, rational voice. In one lesson, Harris likens the meditative state to one of being without a head. Indeed, this particular exercise enjoins the listener to imagine being headless. When I tried this, I could only imagine a headless me, and I found that most unsettling, and then I thought of Ann Boleyn and her beheading. Then, ISIS and Internet beheadings. And then, the Headless Horseman of Sleepy Hollow. I imagined riding off with Ichabod Crane and that ghastly pumpkin. So, you see… I could not shut down my mind: instead, morbid thoughts increased and multiplied. Well, at least I could fight them off with soothing music. So, I removed Harris's app, dialed up Spotify and abandoned the practice forever.

Meditation was for me something akin to Wilde's creative death by opium. The sheer blankness appalled. I found my grief ever more piercing, for in its place was hideous insensibility. As I look back on these two distasteful encounters with the practice, I realize that what I had experienced was a glimpse of non-being. What would it be like, Hamlet wonders, "not to be." After this experience with meditation, when I had promised never to take it up again, I tried to imagine not existing, and what I found was that I was merely imagining. I was still there thinking; and so with Descartes, I concluded that I was. The thought experiment of nonexistence is playfully dramatized in the old Mark Twain fantasy of watching your own funeral. The fact that you are observing the proceedings means that you haven't disappeared. You haven't ceased to exist. The very word "nonexistence" is contradictory. In the act of utterance, it subverts itself.

Perhaps, unlike me, you tried meditation, whether in yoga studio or ashram, and noticed that all around you, many people seem to be getting to that place to which you believe you should be able to go. Through the process of mimetic engulfment, you try to become like them, and slowly you become estranged from your doubting-Thomas self. You silence your doubts, your X self, and take up not-X. And so you live with both, X fading like an isotope and not-X triumphant. The mimetic community of which you are a part blurs your sense of identity and facilitates this process. Your self becomes obscured through its identification with other selves. So, here then, is your new mantra: "I am my normal walk-around-in-the-world-self; I am also a new, enlightened self, free of the contaminations of self-narratives that I and the world have imposed on me. Like Yahweh, I simply am."

Yet, "am" leaves out "was." And, it is the "was," the inquiry into the past, the remembrance of things past, that meditation casts aside. The drive of "the practice" is to confine the practitioner to the present moment, and that habit of mind leaves out William Faulkner's most profound truth about the fluidity of mental time. Meditation confines the self to a purely physiological existence, one defined by respiration. Yet, human identity is not merely tied to sensation, but to things—objects—these are the reliquaries of self. To live in a meditative way is to believe that jettisoning the objects (both people and things) that clutter our lives (but to which we feel attached) is to free oneself from suffering the pangs of loss. Yet, it is those very objects that we are told to slough off that bring a sense of continuity to our lives.

Like everything else in the world, meditation is an ideology, and it has a vigorous marketing campaign going on in its support right now. It has spun off a sequel called "mindfulness training," and it too is both ideology and pathology. Like a commodity, mindfulness is both fetishized and mass-produced. The mindfulness practitioner knows very well that the real terror is of the void, the nothing that lies at the heart of things. But rather than confront that brute fact, he engages in double think and overlooks the illusion of presence which is structuring his reality.

Freud's great gift to the world was his assertion that in the theater of life, we each become real to ourselves as we strut and fret each hour upon the stage, that each life is many days, day after day, and that as we bump into ourselves we transfer to one another all our fictive identities. Life is the theater in which we encounter each other, not in the ashram or the contrived yoga studio. And then at night, in the *Walpurgisnacht* of sleep, we inhabit dreamscapes and play out all our forbidden wishes and desires. We rediscover ourselves as the day's residue becomes a Hollywood backlot aflame with desire.

Banish retrospection? Banish Falstaff. Banish all the world. S

Meditations on Meditation

A Scientific and Clinical Perspective

BY JEFFERSON M. FISH

Early in my career as a professor of clinical psychology, I explored relaxation, hypnosis, placebo (and other expectancy effects), along with various forms of social influence, in helping people to deal with their psychological problems. When therapists use these interventions, clients often experience various degrees of alteration in their conscious experience. For example, in response to hypnotic suggestions, a client may experience the therapist's voice as far away and having deep meaning, and may change his or her behavior. Two different kinds of explanations are offered for the therapeutic change:

1. Hypnotic suggestions lead the client to enter an altered state of consciousness, and this "hypnotic state" enables the client to change his or her behavior, or;

2. A variety of factors—the therapeutic relationship, the client's motivation to change, the expectancy of change associated with the magical aura of hypnosis, the appropriateness of the therapeutic suggestions, and so forth—lead to the behavior change, and the client's altered experience, called a "hypnotic state" is an epiphenomenon. That is, the other factors cause the change, and the altered experience is merely a byproduct. Of course, the novelty and dramatic qualities of the altered experience may well contribute to the motivation for change—but the alteration in conscious experience itself, in this explanation, is irrelevant to the change.

In the course of becoming a psychologist, I not only read about various forms of therapy, and related phenomena like hypnosis and relaxation, and received supervised training in them, but I also made a point of experiencing them as a client or subject. I wanted to understand the phenomena subjectively as well as objectively.

So it was that, nearly 40 years ago, I read a number of books and articles about meditation and attended a residential meditation workshop that lasted about a week. Following the workshop, I practiced a form of meditation focused on my breathing for several months, before I gave it up as too boring.

For the rest of my academic career I pursued other interests, unrelated to meditation. Then, about 20 years ago, I began developing some age-related aches and pains, and I hit on the idea of learning the Wu form of Tai chi—a long series of slow movements that takes about 15 to 20 minutes to complete that began as a Chinese martial art, but is also practiced for its purported health benefits and as a form of meditation. The health benefits, as I understand the rationale, stem from the movements directing and using the flow of Chi (life force/vital energy).

As a Western scientist, I am skeptical about the existence of Chi; but the effects of the Tai chi system on balance and coordination are much easier to accept. Keeping my body moving seemed to have a positive effect on some joints (though not necessarily better than the effect of some other form of exercise or physical therapy), and—who knows—maybe there are other positive health effects.

It certainly doesn't hurt one's mental health to take a break from everyday stresses for a few quiet minutes of slow movements. The calmness and focused attention, required to remember where you are in a long sequence of movements, tend to give you a respite from other concerns.

Then there is the placebo effect. The placebo effect is a real and substantial psychological effect. For the many treatments experimentally shown to be ineffective or only marginally effective, the placebo effect is all there is; and even for effective treatments, the placebo effect is often comparable in magnitude to the treatment effect, thus doubling treatment efficacy. Those who believe that Tai chi or meditation might have positive, or wonderful, or even miraculous

effects, are likely to profit more from it than are skeptics. Of course, overblown expectancies can backfire when they are not realized—but that is a matter for a discussion about placebo rather than meditation. (Full disclosure—my first book, published in 1973, was titled *Placebo Therapy: A Practical Guide to Social Influence in Psychotherapy*. It argued in part that a large proportion of the positive effects of therapy are due to client expectations; and that rather than trying to control for or eliminate placebo effects, therapists should attempt to maximize them.)

Another relevant explanation for the effects of meditation, stemming from the social psychology theory of cognitive dissonance, is the *effort justification hypothesis*. Basically, effort justification argues that people tend to overvalue outcomes that they put effort into achieving. In the case of the Wu form of Tai chi, it took me two years of once-a-week classes, plus nearly daily practice, to master the form. It would seem like a foolish waste of a lot of time and effort if I were to stop practicing it. Hence, it is easy to believe that Tai chi must be good for me. (For the last few years, my practice has diminished to about once a week—in part to keep from forgetting the form. This is an example of effort justification in action.)

Finally, there is the possibility that some benefits might accrue from Tai chi as a form of meditation. The Wu form is a long, repetitive sequence of movements, always performed in the same manner. While going through the movements, you are supposed to maintain focused attention on your body as it moves through space. This, of course, is impossible; but when you realize that your mind has wandered, you are supposed to bring your attention back to the task at hand. This sequence—repetitive task/focused attention/mind wandering/return attention to task—is pretty much a definition of meditation.

Vipassana Meditation

Last year, well into my retirement from academia, I decided to give meditation another try. At the time, I had been impressed by three books written by the historian Yuval Noah Harari: *Sapiens*, *Homo Deus*, and *21 Lessons for the 21st Century*. The last book has a final chapter on meditation. Harari struck me as a clear thinker, able to formulate fundamental questions and cut through the fog of irrelevance to produce significant insights; and he did so without losing his ironic sense of humor. He labeled himself as an atheist, and yet attributed much of the clarity of his thinking to the practice of Vipassana Meditation (VM), a Buddhist technique. I had some skepticism about his meditation

Illustration by Ástor Alexander

The late Satya Narayan Goenka. His audio and video recordings are used to teach the Vipassana Meditation (VM), a Buddhist technique.

claim. He is an Israeli, for whom English is a second language; and yet he has a Ph.D. from Oxford. So I am inclined to believe that he was a clear thinker before he began meditation. Still, I thought, if I'm going to try meditation again, why not VM?

So, near the end of 2018, I took the 10-day residential course at a meditation center in rural northwestern Massachusetts. I drove up a day early and stayed at a nearby motel, to be sure I could reach the center despite slow-moving traffic on snow-, sleet-, and ice-covered dark roads, accompanied by threats of more snow. Having to endure hours of tense driving turned the trip into something of a quest—"if I'm going through this, before even entering on a daunting ten-day experience, VM must be really terrific to justify the effort."

Before leaving, I deliberately read very little about VM because I wanted to approach the experience with fresh eyes. Expectations have a strong effect on how we perceive and react to experiences, and I wanted to minimize that effect, recognizing that doing so might set me up for unexpected insights, positive and/or negative.

Here is an example of avoiding preparation and the insight it brings. More than 50 years ago, a fellow Ph.D. student and I did our clinical psychology internships at a university medical center in California. We decided to take the California Psychological Inventory without reading up on it, so as to ensure a valid test result. We were very different people, with very different personalities, so we were startled to see that we had very similar personality profiles. When we went to the test manual and looked up the standardization data, we discovered that our profiles were not only similar to each other—they were similar to those of a sample of psychology students. So, we discovered that, while we thought we were quite different when compared to each other, it turned out that we were actually quite similar when compared to Californian psychology students-in-general.

In this case, in my self-imposed naiveté, I thought I was going to a meditation center—a place where they teach different forms of meditation, the way a fitness center has different kinds of equipment, and different kinds of classes like Pilates, Zumba, and aerobics. I was signing up for VM, instead of one of the other forms of meditation. How wrong I was. On arrival, I discovered that I was at a Buddhist meditation center, complete with a Pagoda. The Pagoda was off limits (until we were introduced to it at the end of the course) giving it an aura of forbidden fruit. The center made clear that it was about teaching the technique of VM, a technique that could be practiced by members of any religion or no religion, and it did not proselytize. At the same time, it was obviously a Buddhist center.

The 10-day course was an introductory one, opening the door to all kinds of follow-up courses at related centers in the U.S., India, and other countries, ranging in length from a day to a month or longer. If you wanted to further your understanding and practice of VM, there was no way of doing so without furthering your understanding of Buddhism of the variety being taught at Vipassana centers. From my point of view, the more you were to do so, the more you would become a Buddhist in practice (and a member of a VM community), even if you did not label yourself as such.

Once the course begins, there is no contact with the outside world. Students observe absolute silence until the last day—no talking, gestures, or other forms of contact with one another; and, even at the communal vegetarian meals in the dining halls, eye contact is minimized. Each student has an individual room, used only for meditation, personal hygiene, and sleep. Counting both individual and group meditation sessions, compliant students are spending about 10 hours a day meditating.

During the entire period there is a strict separation of the sexes. The women's rooms and dining hall are separate from those of the men. Group instruction and meditation take place in a large hall, with women on one side and men on the other, with access from separate entrances. Students sit on meditation mats, though chairs and/or cushions are available for those, like me, whose age and/or medical problems make meditating on the floor unsustainable. There were about 150 students, evenly divided between men and women.

All Vipassana Meditation discourses and sessions are led by audio and video recordings of S. N. Goenka, a Burmese-Indian man who died in 2013. A male assistant teacher sits on an elevated seat facing the male students, and a female assistant teacher, similarly elevated, faces the female students. At the end of each session, students with questions may line up on the floor in silence, with their feet pointed away from the assistant teacher, and may approach him or her, on their knees, to ask brief questions, in a low voice, to clarify whether they understand what was said or whether they are practicing the technique properly. Other questions—such as what it means to an American to have to approach an elevated seated authority on one's knees to ask a question—are out of order,

since they distract from the single focus of the course—learning the technique of Vipassana meditation.

The meditation technique itself is claimed to have originated about 2,500 years ago with Siddhartha Gautama, the Buddha (Enlightened One), in Myanmar (formerly Burma), and to have been preserved intact over the generations. This claim adds to the credibility of the technique, and hence to positive expectations about its effectiveness. On one hand, the claim is irrelevant because VM has whatever positive and negative effects it has, regardless of its origin. On the other hand, since the Buddha's teachings were passed down through oral tradition for centuries before being written down, it is unlikely that VM as practiced today is unchanged from its original form.

Of the world's major religions, Buddhism is the one with the greatest natural appeal to psychologists because it is actually a psychological system for feeling good and being good—with no concept of a deity or an afterlife. As the Dalai Lama famously said, "If science proves some belief of Buddhism wrong, then Buddhism will have to change." This is an admirable statement that other religions would do well to imitate, and Buddhist monks have cooperated with scientists, for example, by meditating while undergoing an fMRI brain scan. Then again, I haven't heard of any beliefs of Buddhism that have changed thus far. (In addition, while we were meditating in Massachusetts, Buddhists in Myanmar were committing genocide [or politicide, or ethnic cleansing] against the Rohingya Muslim and Kachin Christian minority groups, raising questions about the religion's ability to get people to do good.)

Here is a brief summary of my understanding of Goenka's presentation of Buddhist philosophy and its relationship to Vipassana meditation:

—Reality exists in the present, which is fleeting (less than a millisecond). The past no longer exists, and the future does not yet exist.
—Meditation focuses on what is happening in the present, as we experience it in our thoughts and bodily sensations, and thus meditation puts us in touch with reality.
—Our attachments and aversions cause us to suffer. Attachments—things, experiences, relationships that we want—make us suffer because we do not have them; and, when we have them, attachment to them makes us suffer because we fear losing them. Aversions—unpleasant things, experiences, and relationships—also make us suffer.
—Meditation helps us to experience all sensations as fleeting, such as pleasure and pain, or attachments and aversions, and this loosens their grip on us and helps to free us from suffering.

In the videos, Goenka presents himself as an ordinary person, making a point of being clean shaven and wearing everyday Western/Indian clothes—implicitly contrasting himself with the exotic appearances of Indian gurus who were his contemporaries, such as Maharishi Mahesh Yogi and Rajneesh. Interestingly, though, his biography does contain some parallels to that of Siddhartha, a prince who grew up with the best education available, and was protected in his youth from the misfortunes of the world, until he was shocked by them as an adult, after which he chose the life of an ascetic and religious teacher. His privileged upbringing offered him the freedom, prestige, skills, and advantages to pursue and spread his ideas. Goenka grew up in a rich family, with its attendant education and advantages, and was a successful businessman until failed medical treatments for severe migraine headaches led him to seek relief through, and ultimately dedicate his life to, Vipassana meditation.

Goenka begins and ends meditation sessions with some chanting in Pali, the language of Buddha from 2,500 years ago. Key Buddhist words and concepts in Pali are scattered throughout his presentations, making the initiate feel that "If I want to understand what I'm doing, I'll have to learn what these terms mean and get deeper into the philosophy." Also, while Arabic, Hebrew, Latin, and Pali were at one time everyday languages in which people said things like "It looks like rain," or "Stop fighting with your brother," in the current American context they take on special meaning as the languages of Mohammed, Moses, the early Christian church, or Buddha. That is, they come from a faraway place and a magical, long-ago time, when miracles happened, and the laws of physics were periodically suspended. In addition, at some points, many of the students would chant along with Goenka. We learned, at the end of the course, that about half of those present were "old students," who had taken the course one or more times, perhaps along with other courses. Their chanting made the new student feel left out in comparison to those who knew and could participate with the specialized vocabulary. Thus, the course contained multiple implicit

group pressures, along with the pressure of effort justification to pursue VM further.

Vipassana Meditation and Psychoanalysis

After days of practicing increasingly focused forms of breathing meditation, and with my accompanying feeling of anticipation bordering on impatience, in the final part of the course we got around to Vipassana Meditation itself. The technique involves focusing your attention bit-by-bit on the sensations in your entire body, beginning at the top of your head and gradually proceeding down to the tips of your toes, and back to your head again.

When I discovered that this is what we had been leading up to for days, my initial reaction was one of exasperation: Is this really what I've been devoting all this time and effort to learning? The reason for my reaction is that the VM instructions mirrored, practically word-for-word, a relaxation induction I began using with clients in therapy nearly 50 years ago (though I didn't use the toes-to-head return instructions). In retrospect, it is hardly fair to criticize VM for imitating a 50-year-old technique, when it claims to be 2,500 years old. I decided to calm down, and see where Goenka would go with the technique, and it was indeed different from the way I had used it in therapy.

Relaxation training first became an important therapeutic technique at the beginning of the behavior therapy movement in the 1950s, when Joseph Wolpe used it to treat phobias with his technique of systematic desensitization. Once deeply relaxed, the client vividly imagines the least fearful scene along a phobic dimension until it is no longer disturbing, and then moves on to the next, slightly more upsetting one. In teaching clients to relax deeply, Wolpe would have them tense, hold, and then relax muscles in one part of their body after another, eventually encompassing the entire body. Deep relaxation was usually a novel experience for individuals, adding to the credibility of the technique.

But therapists soon began wondering whether the tense-hold-and-relax sequence was really necessary, or whether merely going through the body and attending to each area would be sufficient. After all, we will movements (like reaching for a glass on a shelf), not muscle contractions (we don't will contractions in the various muscles of our shoulder, arm, hand, and fingers to reach the glass). Leaving out the tensing and relaxing of muscles both sped up the relaxation process, and eliminated clients' counterproductive wondering, "Am I doing this right?" This is because there is no wrong way to attend to a part of your body and see what, if anything you experience.

It turned out that the goal in VM of focusing on the sensations in your body is not deep relaxation—though that might be a side effect—but instead it primarily involves focusing attention ever more intently on the bodily sensations themselves, and in accepting with equanimity the distracting thoughts that arise in the process. From some things the teacher said, VM practitioners appear to accept a rationale for its purported effectiveness that parallels the thought and even language of classical psychoanalysis. For example, as a VM website states, "Ten days is certainly a very short time in which to penetrate the deepest levels of the unconscious mind and learn how to eradicate the complexes lying there." This assumes, controversially, the existence of the following psychological entities and healing process: a multilevel unconscious mind, complexes that exist therein, and the eradication of those complexes through meditation, a process that takes a long time.

Here are some parallels between VM and classical psychoanalysis. In psychoanalysis, the client is instructed to say everything that comes into his or her mind, no matter how unimportant, embarrassing, or upsetting, and whether a thought, image, or any other experience. The analyst, a highly trained and highly paid listener, occasionally points out patterns in what the client says. Of course, putting one's entire stream of consciousness into words is impossible, and when the client falls silent or otherwise deviates from the task, it is called resistance, and the analyst directs the client to return to the task of free association.

One possible explanation for the hypothesized (as opposed to proven) effectiveness of psychoanalysis can be found in the psychological phenomenon of *extinction*. That is, upsetting experiences in the past are associated with unpleasant feelings (fear, anger, sadness), so we learn not to think of them or distort them (aversive conditioning—referred to as repression and defense mechanisms respectively by psychoanalysts). The only way to free oneself from the effects of aversive conditioning is through the process of extinction—like Pavlov's dog repeatedly being presented with the tone, but without the food, until it no longer salivates to the tone. Hence, it is possible that by expressing one's free associations in the non-threatening situation of psychoanalysis, where there are no negative consequences for doing so, the negative emotions associated with the thoughts will extinguish.

In parallel fashion, a possible explanation for the hypothesized (as opposed to proven) effectiveness of meditation may also be found in the psychological phenomenon of extinction. That is, it is possible that

by experiencing one's spontaneous upsetting thoughts and related bodily sensations in the non-threatening situation of meditation, where there are no negative consequences for doing so because the meditator is alone, the negative emotions associated with the thoughts will extinguish. Furthermore, both free associating in psychoanalysis and body scanning in VM lead individuals to develop distance from their fantasies (rather than giving them excessive weight) by viewing them as "just a thought." In psychoanalysis, one views them as just one more free association, and in VM one views them as just one more distraction from the meditation task.

From this point of view, an advantage of psychoanalysis is that you have a trained, if expensive, analyst to keep you on track and point out aspects of your associations you might not have noticed. A disadvantage is that, out of embarrassment or other negative emotion, you might not express all of your thoughts. An advantage of meditation is that you are spared the embarrassment (and cost) of sharing your spontaneous thoughts with another person; but a disadvantage is that you might avoid attending to them without someone to bring you back on track. In this sense, meditation can be seen as a poor person's psychoanalysis.

Another possible explanation for the hypothesized (as opposed to proven) effectiveness of meditation can be found in considering the Buddhist philosophy conveyed in Goenka's discourses as a kind of cognitive therapy. That is, it is possible that being persuaded to let go of attachments and aversions could be the effective ingredient, and the subjective experiences during meditation, while serving a motivational function, could be non-causal epiphenomena (as in the above explanation for hypnosis).

Finally, there are a variety of questionable body psychotherapies (unsupported and/or contradicted by research), which assert that painful experiences and emotions are expressed in unpleasant bodily sensations, and that dealing with the bodily sensations in some way will heal the associated pain. These therapies may include massage and other forms of poking and prodding the body with the intention of releasing supposed repressed material trapped in the musculature or body armor. There are quite a few of these therapies: Wilhelm Reich's Vegetotherapy (going back to the 1930s), Rolfing (popular at the Esalen Institute in the 1960s), and others. VM does seem implicitly to accept the assumption of the bodily manifestations of emotion-laden events, though it deals with them as with all other bodily experiences, by an equanimous acceptance of them as transitory.

Sex and Gender

The strict separation of male and female students during the VM course is similar to that found, both in worship services and elsewhere, in Orthodox Judaism, Coptic Christianity, Islam, and other ancient religions. The VM rationale was that the separation prevents sexual attraction from distracting students from meditation.

Traditional societies are hierarchical, and Asian ones are particularly so (e.g., approaching the assistant teacher on your knees). They are also patriarchal, and maintain strong control over women's sexuality. It was only in the second half of the 20th century, with the introduction of the birth control pill, that women were finally able to control their own fertility—allowing them to separate sexual expression from pregnancy and childrearing. So, in its failure to recognize the 21st century social reality, the VM rationale for separating the sexes seemed anachronistic to me. When we were told the rationale for separating the sexes, my first reaction was, "What about gays?" But, more penetratingly, during a Q & A session at the end of the course, another student asked, "What about individuals who don't identify as either male or female?"

Furthermore, while Goenka was leading us through Vipassana Meditation, with a message to focus ever more clearly on the sensations in ever smaller areas of our body, and to attend to the entire body, he omitted the genitals. To me, it was as if we were to view ourselves as Ken and Barbie dolls. Perhaps the rationale was to avoid students getting distracted from the task of focusing attention by their conflicted feelings about sex. Perhaps it was to avoid potential lawsuits. In any event, it seemed to me that, for VM, sex was a taboo, or at least tainted topic.

Health

I wouldn't be surprised if practitioners of VM experience positive health effects; but I don't think that those effects should be attributed to meditation. For example, prior to the course, I used to have a glass or two of wine with dinner two or three times a week. Now it is more like two or three times a month. Goenka advises students not to use alcohol or other mind-altering substances; and in fact the reason for my diminished use of alcohol is that the accompanying buzz interferes with the concentration needed to meditate.

Since alcohol and other mind-altering substances (especially tobacco) have greater negative effects on health than positive ones, the diminution or cessation of their use is good for health. So the positive effects on health are the result of the changed

health related behavior, not of meditation. Thus, if people were to change their behavior with intoxicants to the same degree as meditators, while spending an equal amount of time watching TV instead of meditating, they would probably experience the same positive health effects. In like manner, studies have shown that Seventh Day Adventists have good health because their religion tells them to be vegetarian; but the positive health effects stem from their diet, not their religious beliefs.

The food at the VM course was vegetarian, so any students who had been on the standard American diet might have experienced an improved sense of well-being after 10 days, resulting at least in part from the diet, but which they might have misattributed to meditation. And if they were to continue both meditating and eating plants, and their health continued to improve, they might continue to misattribute all of the positive effects to meditation.

During the course, students agree to "abstain from killing any being." (This was easy to do in December. Students in the summer might have a hard time not accidentally stepping on an ant or absentmindedly swatting an insect.) Many vegetarians and vegans choose their diets mainly out of concern for the welfare of animals, while others do so mainly for health reasons. But the effects of diet on health stem from what people actually eat, not from their reasons for doing so.

There may also be positive health effects resulting from the relaxation during VM, in addition to any effects from the cognitive processes of meditation. Some have argued that the calming bodily effects of the relaxation response are the opposite of the stressful effects of the fight-or-flight response. At one point during the course, Goenka pushes relaxation to an extreme by asking students to see if they can remain immobile during the entire hourlong meditation. On the other hand, VM is also the opposite of aerobic exercise; and the health benefits of relaxation have to be weighed against the health liabilities of being a couch potato.

Why Meditate?

In learning VM, and thinking about the psychological and health effects of meditation from a clinician's perspective, I found myself distinguishing among:

—the social psychological pressures to meditate and/or continue meditating, and to become part of a VM community,
—the placebo/expectancy effects of meditation,
—the persuasive effects of the theoretical and Buddhist rationales for meditating,
—the evidence, if any, for the truth of the rationales, and
—the effects, if any, of the meditation itself.

(These are the kinds of issues one needs to consider in deciding whether to adopt any purportedly life-enhancing practice. For example, one might substitute an "exercise regimen" or a "plant-based diet" for "meditation" in the list, as in: social psychological pressures to exercise, placebo/expectancy effects of exercise, and so forth.)

It has been a year since the course ended, and I have continued meditating twice a day on nearly all days—averaging not a total of two hours per day as Goenka suggests, but more like an hour and a quarter, which is still a significant amount of time. I've wondered why I haven't stopped meditating, and two answers suggest themselves, both of which have parallels with my continued practice of the Wu form of Tai chi. First, since VM is also a long form with multiple steps, it provides a complex task to perform that has maintained my interest in a way that meditation based on breathing alone has not. And second, because VM, like Tai chi, required a lot of time and effort to learn, there is the pressure of effort justification to keep practicing it.

I also have wondered why I chose to start meditating now. I know that people say that when you get old and closer to death you become more spiritual. That may be true for some people, but not for me. The best answer I've been able to come up with is curiosity. In my 1996 book *Culture and Therapy: An Integrative Approach*, I wrote about an experience I had during my last year of doctoral studies:

> There was a deli across the street from the university where many of us would buy sandwiches to eat in the lounge. One particular time during the winter several of us walked there together, and since it was so close we didn't bother to wear coats. As we crossed the street, I thought to myself, "I feel cold." Suddenly I had a realization: "That's because it is cold!" With my years of personal therapy and training as a therapist, I had become so attuned to every nuance of my inner world that I had become blind to the most obvious elements of my environment and their powerful determining effect on my experience. This epiphany contributed significantly to my decision to get postdoctoral training in behavior therapy.

I think it is as simple as that—after a half century of viewing behavior primarily from external sociocultural and behavioral perspectives, I'm indulging my curiosity about looking inward again. S

Integrative Cancer Care

Below the Bar of Science

BY MICHAEL STEFANEK AND CHRISTINA D. JORDAN

For those unfamiliar with the term "integrative cancer care," simply substitute "integrative oncology," "complementary cancer care," "integrative whole person cancer care," or even, over the protests of practitioners of "integrative cancer care," the more recognized "cancer complementary and alternative medicine." While dating back centuries with such practices as Qigong and meditation,[1] an emphasis on "mind-body" approaches to curing cancer was re-emphasized in the 1970s with such books as Norman Cousins' *Anatomy of an Illness*,[2] Bernie Siegel's "*Love, Medicine, and Miracles*,"[3] and C. Simonton's *Getting Well Again*.[4] Such books promoted the idea that our mind can cure cancer and that positive outlooks, "fighting spirit," or imagining your immune system battling cancer cells can directly impact the disease process itself.

As a practicing health psychologist at the Johns Hopkins Cancer Center, in the early 1980s I (MS) was once physically threatened by the spouse of a patient if I ever dared to approach the topic of death during my counseling sessions with his wife. Fortunately, while psychological counseling can indeed be effective in helping patients with side effects of treatment, quality of life and emotional distress, the idea that "the mind" can cure cancer has largely been debunked and booted from the mainstream media. Likewise, while a number of believers of integrative therapies still promote the idea of dramatic cures in the absence of data (one need not go far on the internet to read of Qigong "healing masters" dissolving tumors in less than a minute),[5] we hear less of cures from miracle drugs or procedures such as laetrile[6] or coffee enemas (cream and sugar?)[7]

Perhaps more so than for any other disease, the belief that complementary and alternative medicine has an assortment of weapons to offer the fight against cancer has persisted. Indeed, the Office of Cancer Complementary and Alternative Medicine (OCCAM) was established in October 1998 to coordinate *and enhance the activities of* the National Cancer Institute (NCI) in complementary and alternative medicine.[8] The National Cancer Institute is the only Institute among the 27 at the National Institutes of Health that has such an office distinct from the NIH National Center for Complementary and Integrative Health (NCCIH).[9]

The popularity of such integrative approaches prompted the birth of a new professional organization, the Society of Integrative Oncology (SIO). Founded in 2003, the mission of the SIO is to "advance evidence-based, comprehensive, integrative healthcare to improve the lives of people affected by cancers."[10] More specifically, integrative oncology is a "patient-centered, evidence-informed field of cancer care that utilizes mind and body practices, natural products, and/or lifestyle modifications from different traditions alongside conventional cancer treatments. Integrative oncology aims to optimize health, quality of life and clinical outcomes across the cancer care continuum and to empower people to prevent cancer and become active participants before, during and beyond cancer treatment."[11]

As noted in the definition above, the SIO does not exclude the utilization of integrative therapies to directly impact disease prevention, clinical outcomes, and health. However, much of its focus is on treating cancer side effects or side effects caused by the surgery, radiation, or chemotherapy that accompanies the disease.

A recent study analyzed the website presence of information promoting integrative therapies and the provision of integrative oncology services across 45 leading Cancer Centers in the United States.[12] The authors published a similar review in 2010[13] and wanted to assess the number of cancer centers that currently promote integrative therapies on their websites in comparison to seven years earlier. They also assessed how many centers *provide* integrative therapies currently. The assessment involved 20 such therapies, including "standard" complementary and alternative therapies such as acupuncture, Qigong, Tai Chi, Healing Touch, Reiki, along with movement/creative interventions such as art, dance, and exercise. The results were striking. Overall, the number of websites that provided information increased an average of 27% ranging from guided imagery (-6.1%, the only therapy to decrease) to dietary supplements

promoted by 52% more of the cancer centers. In terms of absolute numbers, 17 centers promoted information on guided imagery in the most recent analysis (a very slight decline from 18), while dietary supplements were promoted most recently by 42 of the 45 centers, up from only 17 in 2010.

All 20 integrative oncology therapies were provided at the centers to some degree. Only 3 centers offered Ayurveda,[14] while "healing touch" was included at 13 (29%), Reiki at 18 (40%), and Qigong at 16 (36%). Nutritional services were provided at 41 of the centers (91%).

Soon after, one of the leading cancer professional organizations—the American Society of Clinical Oncology (ASCO)—reviewed and supported a number of the recommendations made by the Society of Integrative Oncology.[15] Thus, the SIO now has the support of ASCO. This association will clearly be used as a "marketing" tool, with integrative oncology practitioners promoting the position that integrative therapy now has the endorsement of the oncology community. It may be likely that the number of major cancer centers promoting integrative therapies on their websites and utilizing resources to provide integrative oncology services will continue to grow.

It appears that we have a significant increase in major cancer centers promoting integrative therapies on their websites, a significant number of major cancer centers providing integrative oncology services, and a major cancer organization endorsing guidelines promoted by the Society of Integrative Oncology.

So What's the Problem?

At first glance, this may not appear to be a problem. An organization defining itself as "evidence-based" in the fight against cancer now has many of the therapies it has promoted endorsed by a major cancer organization. Moreover, the acceptance of the therapies is increasing in major cancer centers. What is there to be concerned about?

The first consideration is whether the magnitude of the increase in the use of integrative oncology practices is accurately presented over the 7-year period between the completed studies. The lack of precise definitions of categories and the over-inclusion of interventions that are counted as integrative—that is, therapies that purportedly need to be "integrated" into mainstream medicine—is problematic. For example, nutritional consultations were commonly used even when I (MS) was practicing at Johns Hopkins several decades ago. These consultations were not viewed as "integrative," "alternative," or "complementary" therapies. As a function of the disease or treatment, many patients were challenged to take in enough nutrition to maximize their health. Nutritionists were not huddled away in an "integrative" clinic, but were already clearly part of mainstream medicine.

The same could be said for labeling "dietary supplements" as integrative. Many patients may suffer from vitamin or mineral deficiencies from the disease or treatment and receive such supplements. This is not "evidence" for the use of integrative therapy in cancer centers. It is not clear if information provided on cancer center websites indicates that such services are part of mainstream medicine. If so, its inclusion in the analysis as "integrative" is suspect. There is no mention of how much of the information on the websites or services provided is drawn from real science as part of already accepted mainstream medicine vs. the quackery that often comes with alternative nutritional approaches. This holds especially true for the inclusion of exercise, given that physical activity has been clearly demonstrated to provide benefit in terms of cancer prevention, recurrence, and quality of life.[16] Exercise is clearly part of mainstream medical practice.

In sum, several integrative oncology interventions do not fit the definition at all. They are clearly already part of mainstream cancer care. This artificially inflates the results of the analysis, particularly given these interventions (nutritional consultations, dietary supplements, exercise) are by far the services most often provided and most widely promoted by the cancer centers reviewed.

First, it is unclear whether the two analyses (2010 and 2017) are comparing "apples to apples." In the 2010 study,[13] the category of "supportive care" was utilized (the title of the article was "complementary and alternative medicine and supportive care") as well as a listing for "support groups," which again would be seen by most professionals and patients as mainstream. There was no such category in the most recent analysis and one wonders how "support groups" were categorized. In addition, the analysis of websites was conducted by two researchers "after initial training." In addition to not describing how such training occurred, the "researchers" were in fact the two primary authors of the study—clearly leading to a strong possibility that the analyses were biased in favor of "finding" integrative oncology practices.

Second, there is little evidence for many of the interventions noted. There are a number of reviews[17, 18, 19] that question the effectiveness of many of the "integrative therapy" practices reported in the study. Practices such as healing touch, massage, acupuncture, Qigong, and Tai Chi do not have quality research to support their use. Most often, when results have shown benefit, the

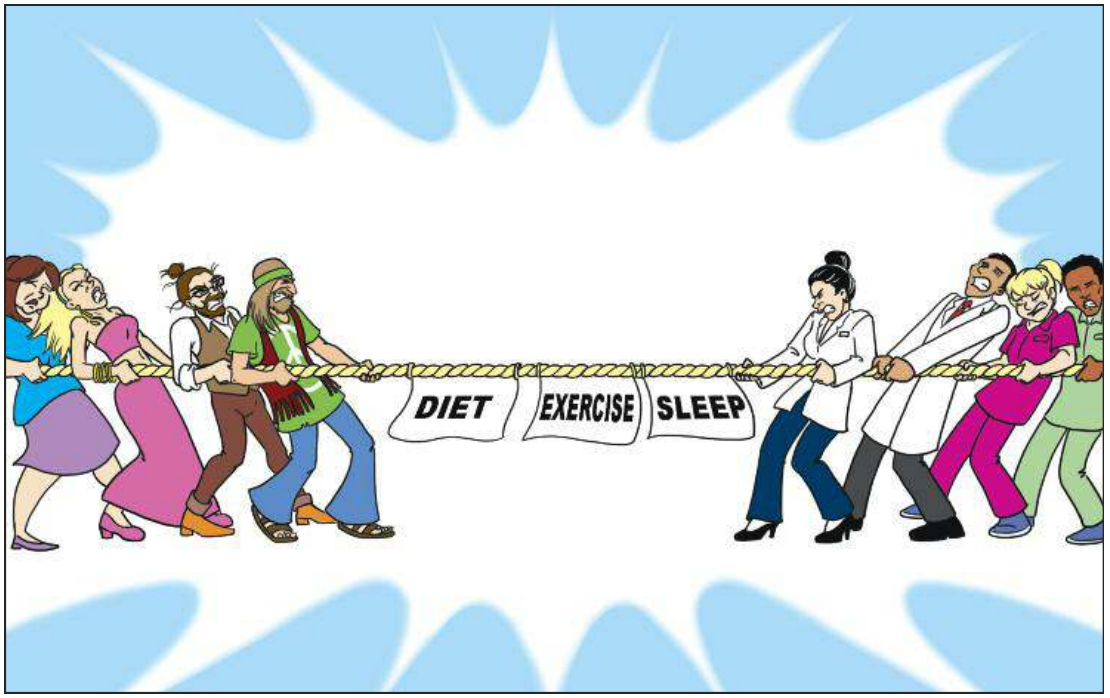


Illustration by Anna Maltese

comparison group is almost always "usual care." Thus, any benefit in anxiety, feelings of depression, or quality of life cannot be ascribed to the specific intervention used. Benefits could be due simply to increased time spent with a caring professional, supportive conversations between the integrative therapy practitioner and the patient, or other non-specific effects.

Third, and related to the above, there is the issue of transparency and patient decision-making. It is unclear if and how information about the limited effectiveness of many of the integrative therapies is presented to patients, allowing them to choose therapies that might be most effective for them, or if indeed, they weigh the cost-benefit (e.g., chances of decreased anxiety vs. time away from family) and decide that no intervention is their best option. Patients have a right to know the potential effectiveness of their surgery, radiation, and chemotherapy treatments. Likewise, they have a right to know the supportive evidence for interventions that may impact their quality of life.

Fourth, the point is often made that patients are "demanding" such integrative services. However, patients did not demand such services until advocates filled their heads with silly nonsense about practices such as invisible energy fields and "healing touch." Cancer centers should not initiate or continue these practices because their patients fall victim to the recommendations of alternative practitioners.

Integrative oncology supporters often tout "the whole person" approach to treatment their practices support. If this is the case, we should not simply bow to patient demands. If patients demanded medical treatment that was not consistent with good evidence, it is doubtful that oncologists would provide it since the evidence would not indicate benefit. Major cancer centers should not provide services without evidence of benefit and should clearly not do so simply to "keep up with the Jones's" or for the positive financial impact these services might provide on a fee-for-service basis.

Fifth, it is unclear who is "minding the store." That is, who is monitoring the provision of services to ensure that only integrative therapies with solid evidence for specific outcomes are utilized? The Society of Integrative Oncology is clearly a promoter of integrative therapies and supports any number of such that clearly have no reasonable biological basis (e.g., "healing touch," homeopathy), so they clearly cannot assume the role of guardian of science-based medicine. The claim that practices well within the medical mainstream (exercise, nutritional consultations) are "integrative" brings more acceptance to "integrative therapy." With this acceptance, it is not unreasonable to believe that homeopathy, chiropractic, naturopathic medicine, or aromatherapy will be provided (and perhaps already are) in major cancer centers. As noted previously, many of the practices included in the study lack solid evidence of effectiveness. The promotion of such therapies by these centers does not provide a great deal of confidence that cancer "quackery" will not continue to breach the walls of what are supposed to be

islands of hope that patients can rely on to provide the best evidence-based "whole person" cancer care.

Where Do We Go From Here?

It may be too late to expect major cancer centers to pull the rug out from under clinics or services touted as integrative therapy. One could argue that this is not necessary if steps are taken to ensure that these services demonstrate the same level of evidence-based practice demanded by the cancer centers of their surgeons, medical and radiation oncologists, nurses, and other health professionals.

First, the "integrative oncology" movement thrives on its emphasis on the "whole person," being "patient centered" or "holistic," as if this sets apart the field of "integrative oncology." If these treatments were truly "holistic" or focused on the "whole person" then they would also work directly on the disease itself—as medical and radiation and surgical oncologists do. It is artificial marketing to promote these practices in such a way, implying that while others only care about "the tumor," they possess a monopoly on caring for the whole person. During my (MS) years working in cancer centers, I have known many physicians, nurses, and many other health professionals who feel strongly that they also care for the "whole person." As noted, if caring for the whole person is central to the approach, then sharing information about the effectiveness of each intervention—who it works for and how much benefit might be derived—should be a discussion that occurs between each integrative practitioner and his or her patient.

Second, the Society for Integrative Oncology should support moving practices that have established effectiveness out of the integrative oncology framework. Indeed, their 2017 guidelines for breast cancer care did not include physical activity because this intervention has a strong evidence base and is considered mainstream. Thus, there is no longer any need to "integrate" them into standard patient care. Including them in publications touting integrative oncology[12] artificially inflates the numbers of cancer centers incorporating integrative therapies and links other questionable practices with more established practices under the label of "integrative"—a slippery slope that encourages cancer "quackery". Likewise, those many interventions not found to be helpful or found to be only minimally helpful in systematic reviews should not be "integrated" therapies but rather "abandoned" therapies.

Third, those centers promoting integrative oncology need to adequately define the term "evidence-based." In the past, the Office of Complementary and Alternative Medicine of the National Cancer Institute funded "best case series" proposals, a standard for funding far below the bar of any other NIH Institute or office. How do they define "evidence"? Patient anecdotes? Single case studies? Randomized clinical trials? Most randomized trials involving integrative oncology practices simply compare the given integrative therapy approach with "usual care." This is a very low bar to use when promoting effectiveness. What is needed is comparative effectiveness research to determine how integrative therapy approaches compare to not only "usual care" but to any "active" treatment (e.g., more time speaking with counselor or a support group intervention). This allows one to determine if there is any true advantage to the given integrative therapy. In addition, studies with larger sample sizes are needed so results can be interpreted with more confidence. Relevant to research needs, one could reasonably claim that all patients receiving any type of integrative therapy should be formally enrolled in a research protocol given we know so little about what works, how well interventions work, and who they work for. Clearly laying out the benefits and costs in an informed consent document would also serve to ensure patients are well informed about any therapy offered, and may well help to standardize treatment across different practitioners.

Fourth, the call for credentialing integrative medicine therapists[12] is very premature. What is needed is more research in those areas showing any benefit with more powerful research designs in order to determine what works for who and what credentialing of any kind should look like. Should there be credentialing for every practice noted in the survey so that we might have practitioners "credentialed" in Qigong, "healing touch," etc.?

Finally, the FDA sends out warning letters to companies touting fake cancer cures.[20] These letters are sent to ensure consumers do not fall victim to false claims of cancer cures. Perhaps we should institute a similar process for those promoting integrative therapies to ensure that patients are aware that many of these practices have not demonstrated any convincing evidence of benefit. While the "cost" of the use of such therapies most often pales in comparison to the threat posed by fake cancer medicinal cures, such messages to cancer centers may help alert them to bogus interventions being implemented with their blessing, within their institutional walls.

Conclusion

A large number of major cancer centers provide support for, in many cases, unproven "integrative therapies," and many provide direct integrative therapy

services to patients. This is likely due to both patient demand and integrative therapy practitioners "push" for inclusion. I would argue that the majority of such advocates of integrative therapy and leaders in cancer centers allowing such therapies to be promoted or practiced in their settings are well-intentioned and caring professionals. They most often genuinely want to help patients in their struggle with cancer. Unfortunately, there has been little patience to gather the data to support this decision. We have allowed "service" to arrive before we have solid evidence to indicate that the interventions help or that they provide the most benefit compared to other interventions. This has occurred in part because the "costs" do not include death or increased morbidity, as might occur if we rushed to judgment with surgery or radiation or chemotherapy treatments. I echo Marcia Angell's plea years ago as editor of the *New England Journal of Medicine* that "it is time for the scientific community to stop giving alternative medicine a free ride…there is only medicine that has been tested and medicine that has not…alternative treatments should be subjected to scientific testing no less rigorous than that required for conventional treatment."[21]

It is the responsibility of each major cancer center to decide if they are an evidence-based institution and if patient interventions—promoted or directly provided—are effective in providing "whole person care." There should not be two standards of evidence —one used only when disease cure or physical morbidity is involved and one used when the outcomes are more focused on quality of life and emotional distress. I think we would all agree that the latter outcomes are critically important ones to patients, family, and friends faced with what continues to be one of our most feared diseases: cancer. Patients facing this diagnosis deserve treatment that has demonstrated benefit and can reasonably be considered science-based. Holistic care rings hollow if such care is below the bar of science. S

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Why We *Are* Living in a Post-Truth Era

BY LEE MCINTYRE

Some people deny facts and truth. Others deny that facts and truth are in any danger. Both are wrong. In his recent essay[1] titled "Why We Are Not Living in a Post-Truth Era" (Skeptic, Vol. 24, No. 3), Steven Pinker argues not only that we are not living in a post-truth era, but that the very idea of post-truth is something of a contradiction in terms. He begins with a glib argument borrowed from a philosopher's response to relativism:

> Consider the statement "We are living in a post-truth era." Is it true? If so, it cannot be true.

That is, to say we are living in a post-truth era is itself to make a truth claim…which demonstrates that truth must matter after all.

But who said that it didn't?[2] The idea of post-truth has often been misunderstood, by Pinker and others,[3] to reduce to one of several straw men:

(1) that truth doesn't matter,
(2) that no one really cares about truth anymore,
(3) that no one can find the truth,
(4) and that if we were actually living in a post-truth era, we should just give up.

Instead, the claim that we live in a post-truth era is properly based on the idea that truth today is under threat. Our society has an infection that needs to be treated, even if it is not quite yet life-threatening. Isn't it therefore possible that claims 1-4 above are false, yet we should still take the idea of post-truth seriously?

We live in a time when far too many people—especially those in positions of power—lie about or ignore reality, and seem to pay no political price for it. In my book *Post-Truth* (MIT Press, 2018), I define post-truth as the "political subordination of reality." It is a tactic in the authoritarian toolbox, whereby disinformation is used not simply to convince someone that a falsehood is true, but to so overwhelm the information stream with fakery that it can cause the citizenry to give up on the idea of facts and truth all together. As Jason Stanley points out in his outstanding book *How Propaganda Works,* propaganda is not meant to convince you, but to show you who's boss. A true authoritarian does not need your cognitive consent. Instead, their message is: "I am so powerful

Illustration by Izhar Cohen

that I can dominate your reality, and there is nothing you can do about it."

The eminent historian of fascism Hannah Arendt provides the parallel for our present situation when she observes that "the ideal subject of totalitarian rule is not the convinced Nazi or the convinced communist, but people for whom the distinction between fact and fiction…true and false…no longer exist." In his 2017 book *On Tyranny,* Tim Snyder makes the point even more succinctly: "post-truth is pre-fascism."

Perhaps it's a matter of degree and timing. I agree with Pinker when he observes that the manipulation of information is hardly new, and that politicians have always lied, dissembled, and distorted the facts. But post-truth is not mere lying or distortion. While it may involve the spread of falsehood, its purpose is political, not epistemological. With post-truth, no one is asking for your agreement.

When President Trump notoriously took a sharpie to a NOAA weather map[4] so that he was "not wrong" about the path of Hurricane Dorian (drawing its moving path to include territory Trump said it would), most of the country just laughed at him. But isn't this tactic identical to his chilling insistence, just after the massacre at the Tree of Life synagogue in Pittsburgh, that he was justified in holding a rally[5] that night because the NYSE was open the day after 9/11? When it was pointed out to Trump that this was in fact false (the NYSE was closed for six days after 9/11), it did not seem to matter. Trump went on to hold his rally not because his lie had convinced anyone, but because there was no political price for it.

Pinker is well known these days for his optimistic contention (he calls it realistic), in his 2018 book *Enlightenment Now*, that we are living in what by many measures is the best era of human history. So why all the catastrophizing? As Pinker points out in his post-truth essay, fake news constituted less than 1% of online communication[6] in the run up to the 2016 election, and even that seemed targeted toward people who had already made up their minds. How to square this, though, with the conclusion *from the same study that Pinker cites* that the penetration of false stories[7] reached over one quarter of the American electorate, with unknowable consequences for its outcome?[8] Such unknown costs may be negligible; then again, they may be non-negligible, in which case concerns about the hacking of the 2020 election may be justified. Here it would seem the precautionary principle may apply.

While Pinker's cheery graphs and statistics may be accurate, they do little to assuage our sense that the risk to facts and truth during the Trump era is a potential crisis for democracy. Of course, Pinker might point out that such alarm could (ironically) itself be due to the degree to which we are succumbing to worry and emotion that is coloring our beliefs about post-truth itself! Yet perhaps it is possible that, even while Pinker's measures of well being are all valid, the risks are nonetheless higher as well. Think of the analogy here with war. Couldn't it be true that while we are living in one of the most peaceful eras of human history, we also live in a time of greatest threat in that a single (nuclear) war could wipe out humanity? Even Pinker admits this to be the case in both *Enlightenment Now* and in *The Better Angels of Our Nature*, in which he made clear his support for a nuclear-free world.

To say that we now live in a post-truth era does not mean that no one believes in truth or that all of the progress of science and reason has been wiped out; it means that despite the fact that millions of us still care about truth, we feel helpless in watching the standards of evidence and accountability erode before our eyes. To make the claim that we could not be living in a post-truth era because too many people care about truth is like saying that we could not be living in a era of institutional racism, because there are so many people these days who are attuned to the problems of race.

I am also in robust agreement with Pinker on the importance of science and reason: we should not deny facts, truth, and reality. Where we seem to disagree is on the question of whether science and reason are under genuine threat. The threat to truth is posed both by those (like Trump) who would subvert the truth for political gain, and also by those who would deny that such a threat actually exists.

Even if Pinker is right that we are now living in an era of extraordinary progress and accomplishment, it may all come crashing down if we don't take the threat from post-truth seriously. S

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The Truth About Post-Truth Truthiness

BY MICHAEL SHERMER

Words embody ideas, and their changing usage and meaning are tracked by lexicographers in dictionaries, which therein become barometers of cultural trends. In 2006, for example, the American Dialect Society and Merriam-Webster's both chose as their word of the year the neologism "truthiness", introduced by the comedian Stephen Colbert on the premiere episode of his satirical mock news show *The Colbert Report* (on which I appeared twice[1]), meaning "the truth we want to exist."[2] It was a prescient comedic bit as a decade later three examples of truthiness entered our lexicon.

After Donald Trump's Presidential inauguration on January 22, 2017, his special counselor Kellyanne Conway concocted the term "alternative facts" during a *Meet the Press* interview while defending White House Press Secretary Sean Spicer's inaccurate statement about the size of the crowd that day. "Our press secretary, Sean Spicer, gave alternative facts to that [the inaugural crowd size], but the point remains that...." at which time NBC correspondent Chuck Todd cut her off: "Wait a minute. *Alternative facts*? ... Alternative facts are not facts. They're falsehoods."[3] German linguists deemed it the "un-word of the year" (*Unwort des Jahres*) for 2017. Later that year the related term "fake news" became common parlance, leaping in usage 365 percent and landing it on the "word of the year shortlist" of *Collins Dictionary*, which defined it as "false, often sensational, information disseminated under the guise of news reporting."[4]

Such words (or un-words) are often invoked as evidence that we are living in a "post-truth" era brought on by Donald Trump (according to liberals) or by postmodernism (according to conservatives). Are we living in a post-truth world of truthiness, fake news, and alternative facts? Have the populists and postmodernists won the day? Is all the political, economic, and social progress we have achieved over the past several centuries in reversal—the abolition of slavery and torture, the decline of homicide, crime, and violence, the cessation of the European Great Powers wars, and the expansion of the moral sphere to include civil rights, women's rights, children's rights, worker's rights, and gay rights for more people in more places more of the time? Are we lurching backwards to the Middle Ages when bigots lighted faggots to torch women as witches?

No. The Fall 2019 cover story of *Skeptic* by the Harvard psychologist Steven Pinker, "Why We Are Not Living in a Post-Truth Era," explains why, starting with this question: Is the statement "We are living in a post-truth era"...true? If it is, then it isn't! That is, if you argue that the statement is true then you are making an argument, which means you are committed to determining whether the statement is true or false, which means we have not passed into a post-truth world. Similarly, is the statement "humans are irrational" rational? If it is, then it can't be because, as Pinker asks rhetorically, "If humans were truly irrational, who specified the benchmark of rationality against which humans don't measure up?"[5] As Pinker reflected in his 2018 book *Enlightenment Now: The Case for Reason, Science, Humanism, and Progress*, "Mendacity, truth-shading, conspiracy theories, extraordinary popular delusions, and the madness of crowds are as old as our species, but so is the conviction that some ideas are right and others are wrong."[6]

In this issue of *Skeptic* the philosopher Lee McIntyre, author of the book *Post-Truth*,[7] challenges Pinker, starting with a definition of post-truth as the "political subordination of reality," which he ascertains to be "a tactic in the authoritarian toolbox." McIntyre's definition is much narrower than the way Pinker and I use the term, confining it as he does to political propaganda, which he says "is not meant to convince you, but to show you who's

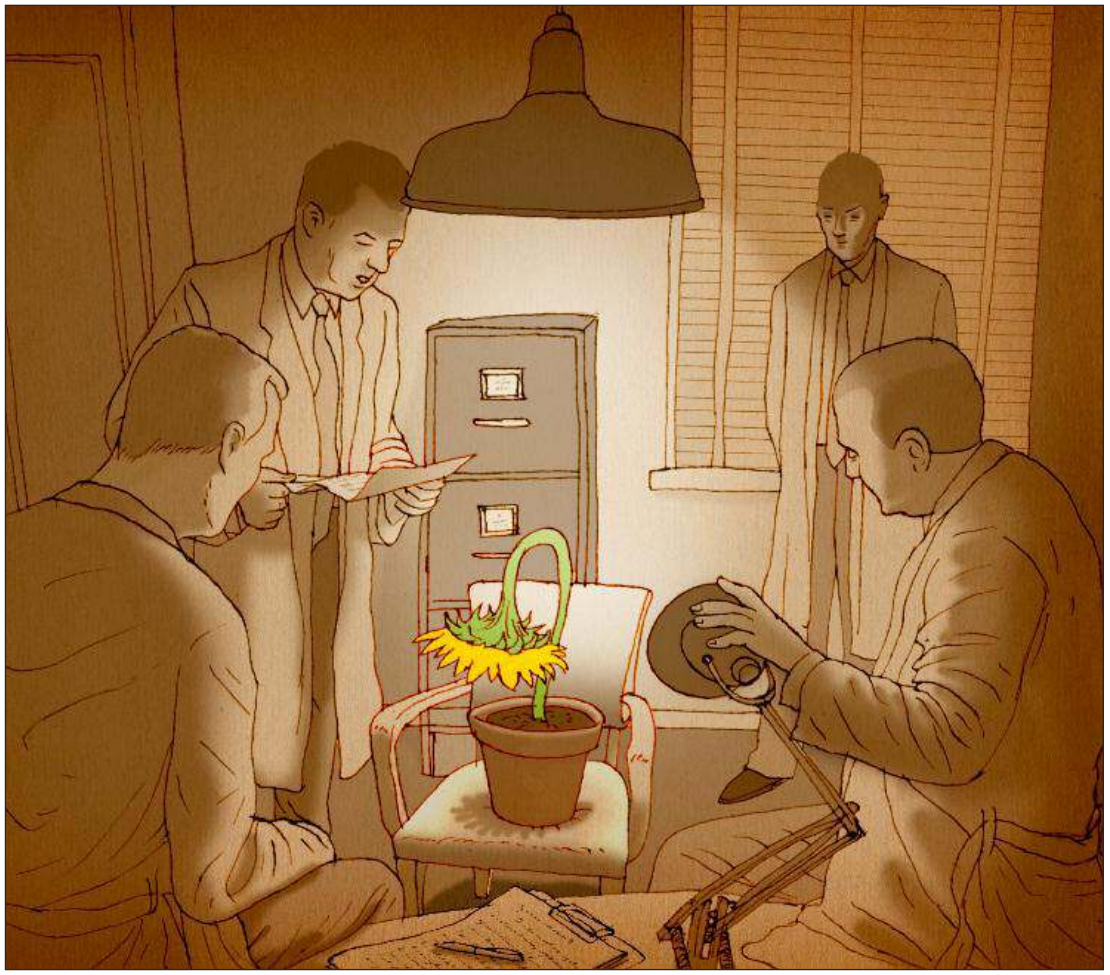

Illustration by Izhar Cohen

boss." The message, he says, referencing Jason Stanley's book *How Propaganda Works*,[8] is "I am so powerful that I can dominate your reality, and there is nothing you can do about it." To reinforce the political nature of post-truth, McIntyre also invokes Tim Snyder's observation in his 2017 book *On Tyranny* that "post-truth is pre-fascism,"[9] along with Hannah Arendt's observation that "the ideal subject of totalitarian rule is not the convinced Nazi or the convinced communist, but people for whom the distinction between fact and fiction (i.e., the reality of experience) and the distinction between true and false (i.e., the standards of thought) no longer exist."[10]

Post-truth as political propaganda is certainly one use (or misuse) of truth that neither Pinker nor I discount, but McIntyre then accuses Pinker (and others) of merely knocking down one or more of four post-truth straw men: (1) that truth doesn't matter, (2) that no one really cares about truth anymore, (3) that no one can find the truth, and (4) that if we were actually living in a post-truth era, we should just give up. Instead, to steel-man the problem McIntye asserts that "the claim that we live in a post-truth era is properly based on the idea that truth today is under threat."

Is it? There certainly are people who, pace Hannah Arendt, cannot seem to distinguish between fact and fiction, true and false, and this shortcoming can lead not only to fascism or communism, but also to Holocaust denial, evolution denial, climate denial, vaccine denial, GMO denial, and more. But is it really that people cannot discern reality, or is it that they are motivated to spin the facts to support some other agenda? Holocaust deniers are anti-Semites. Evolution deniers are religious fundamentalists. Climate deniers mistrust big government. Vaccine deniers distrust big Pharma. GMO deniers detest Monsanto. It isn't the truth about the facts under dispute, but an underlying motive. Consider an interview reprinted in McIntyre's book, which he presents

as a type specimen of post-truth, in which CNN's Alisyn Camerota engages the former Republican Speaker of the House Newt Gingrich on crime rates. The exchange is revealing:[11]

Camerota: Violent crime is down. The economy is ticking up.
Gingrich: It is not down in the biggest cities.
Camerota: Violent crime, murder rate is down. It is down.
Gingrich: Then how come it's up in Chicago and up in Baltimore and up in Washington?
Camerota: There are pockets where certainly we are not tackling murder.
Gingrich: Your national capital, your third biggest city…
Camerota: But violent crime across the country is down.
Gingrich: The average American, I will bet you this morning, does not think crime is down, does not think they are safer.
Camerota: But it is. We are safer and it is down.
Gingrich: No, that's just your view.
Camerota: It is a fact. These are the national FBI facts.
Gingrich: But what I said is also a fact. … The current view is that liberals have a whole set of statistics that theoretically may be right, but it's not where human beings are. People are frightened.
Camerota: But what you're saying is, but hold on Mr. Speaker because you're saying liberals use these numbers, they use this sort of magic math. These are the FBI statistics. They're not a liberal organization. They're a crime-fighting organization.
Gingrich: No, but what I said is equally true. People feel more threatened.
Camerota: Feel it, yes. They feel it, but the facts don't support it.
Ginerich: As a political candidate, I'll go with how people feel and let you go with the theoreticians.

As I read it, this isn't an example of the post-truth equivalent of, as McIntyre describes it, a "chilling exchange in the basement of the Ministry of Love in the pages of George Orwell's dystopian novel *1984*." Camerota and Gingrich are simply talking about two different matters: crime rates and peoples' perceptions about crime rates. The difference represents a cognitive illusion due to the availability bias, in which one assesses a problem based on the most immediate and salient available example, usually from the evening news that features individual crimes, especially homicides. Camerota is a journalist focusing on the long-term decline of crime, whereas Gingrich is a politician trying to garner support by appealing to peoples' fears about crime, citing the equally true statistics about recent upticks in crime in a handful of U.S. cities, most notably Chicago, Baltimore, and Washington D.C., which Camerota acknowledges. Both facts are true, so this is not an example of recent post-truthiness but of good old-fashioned spin-doctoring, which has been around at least since the 1940s, when George Orwell noted: "Political language—and with variations this is true of all political parties, from Conservatives to Anarchists—is designed to make lies sound truthful and murder respectable, and to give an appearance of solidity to pure wind."[12] The problem can be traced back even further, as when Edmund Burke commented on the language surrounding the French Revolution:

> The whole compass of the language is tried to find sinonimies [synonyms] and circumlocutions for massacres and murder. Things are never called by their common names. Massacre is sometimes called agitation, sometimes effervescence, sometimes excess; sometimes too continued an exercise of a revolutionary power.[13]

McIntyre says that the purpose of post-truth "is political, not epistemological," but is not the former subsumed in the latter? It's all epistemological, inasmuch as everything turns on what constitutes reliable knowledge, and that is a very old problem indeed.

Even the concept of post-truth is not new. The *Oxford Dictionaries* has tracked its use back to 1992, the year we founded *Skeptic* magazine, the early years of which were devoted to the "science wars," which were fought over the nature of truth and whether or not science was the royal road to it. Many thought not, coming to believe that there is no objective reality to be discovered and no belief, idea, hypothesis, or theory that is closer to the truth than any other. In his 1996 *Skeptic* article "More Higher Superstitions," Norman Levitt (co-author of the book *Higher Superstition*[14]) describes the problem in language that could have been written in 2019:

> Science studies…overlaps what is nowadays called cultural studies, a tendency that has effaced traditional scholarship in a number of areas, and it has

> absorbed many of the radically relativistic attitudes that predominate in postmodern cultural anthropology. The central doctrine of science studies is that science is "socially constructed" in a way that disallows traditional notions of scientific validity and objectivity. On this view, scientific theories are merely narratives peculiar to this culture and this point in its history. Their chief function is to create stories about the world consonant with dominant social and political values. Thus, they are no more "true," or even more reliable, than the myths, legends, and just-so stories of other cultures. All are equally culture-specific.[15]

Post-truth claims were just as prominent in the 1990s as they are now, and no less criticized, even parodied. Recall that this was the decade of the wildly popular television series *The X-Files*, a conspiracy-laden mosh pit of aliens and UFOs, monsters and demons, mutants and shape-shifters, urban legends and government cover-ups, and all manner of paranormal piffle. So trendy was the show that *The Simpsons* caricatured it with an episode titled "The Springfield Files," in which Homer has a close encounter of the third kind after downing ten bottles of beer. *X-Files* stars Gillian Anderson and David Duchovny (Scully and Mulder) guest star as investigators of the alien abduction, and Leonard Nimoy, host of the 1970's more-or-less nonfiction version of *The X-Files* called *In Search of…*, voiced the introduction, announcing: "The following tale of alien encounters is true. And by true, I mean false. It's all lies. But they're entertaining lies, and in the end isn't that the real truth? The answer is no."

So post-truthiness is not new, but the availability bias dialed up to eleven through social media led the *Oxford Dictionaries* to name "post-truth" as its word of the year in 2016 after it documented a 2000 percent spike in usage over the previous year, characterizing it as "relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief." As the dictionaries' editor Casper Grathwohl noted: "We first saw the frequency really spike this year in June with buzz over the Brexit vote and again in July when Donald Trump secured the Republican presidential nomination. Given that usage of the term hasn't shown any signs of slowing down, I wouldn't be surprised if post-truth becomes one of the defining words of our time."[16] Even the veteran CBS anchorman and *60 Minutes* correspondent Scott Pelley succumbed to the temptation to think we're living in a post-truth era. On the final day of 2019, reflecting on the message of his new book *Truth Worth Telling*, summed up what has happened to truth in the decade of the 2010s:

> This is the thing that worries me the most about our beloved country. We have gone from the information age to the disinformation age. I think our viewers and our readers now have a responsibility that they've never had before, and that is that they have to be careful about how they choose their information diet. This is going to be a problem for the rest of our history, in particular for democracies.[17]

Not only is post-truthiness not new, but the response to challenges to objective knowledge are as robust today as in the past, if not more so, having moved far beyond the pages of niche magazines like *Skeptic* and *Scientific American*, which defend science, reason, empiricism, and fact checking, and is now routinely addressed in national news magazines and newspapers. Despite President Trump's constant reference to the "failing *New York Times*" in his Twitter feed,[18] for example, the circulation of the Grey Lady has skyrocketed since Trump was elected. In the 4th quarter of 2018 alone, for example, the *New York Times* added 265,000 digital subscriptions, turned a profit of $55.2 million, and saw its newsroom staff grow to 1,600 people, the largest number in its 167-year history.[19]

Today, as dictionaries track the upswing in post-truth language, and as political pundits pronounce the end of truth and with it the Republic (if you can keep it), the Internet of ideas has responded with tools to combat the illiberalism of unreason: real time fact-checking. As politicians engaged in the old-time art of spin-doctoring the truth in speeches, fact-checkers at OpenSecrets.org, Snopes.com, FactCheck.org, and PolitiFact.com tallied their errors and lies, the latter cheekily ranking statements as *True, Mostly True, Half True, Mostly False,* and *Pants on Fire*. As PolitiFact's editor Angie Holan explained: "journalists regularly tell me their media organizations have started highlighting fact-checking in their reporting because so many people click on fact-checking stories after a debate or high-profile news event."[20]

Finally, the idea that post-truthiness could invade the brains of gullible citizens is gainsaid by new research by cognitive scientists that demonstrates that people are not nearly as gullible as we've

been led to believe. A 2020 book by the cognitive scientist Hugo Mercier, *Not Born Yesterday*, presents a mountain of evidence "against the idea that humans are gullible, that they are 'wired not to seek truth' and 'overly deferential to authority', and that they 'cower before uniform opinion'," quoting Jason Brennan in his book *Against Democracy*. In fact, Mercier reveals through both laboratory research and real-world examples that "far from being gullible, we are endowed with a suite of cognitive mechanisms that evaluate what we hear or read." And far from defaulting to believing everything we hear, Mercier notes that "by default we veer on the side of being resistant to new ideas. In the absence of the right cues, we reject messages that don't fit with our preconceived views or preexisting plans. To persuade us otherwise takes long-established, carefully maintained trust, clearly demonstrated expertise, and sound arguments."[21]

Mercier begins by showing why evolution could not have created animals that are so gullible as to be routinely exploited by others, as that would ultimately lead to reproductive failure and the extinction of extreme gullibility. The balance in communication between belief and skepticism led to an evolutionary arms-race between deception and deception detection, along with cognitive mechanisms "that help us decide how much weight to put on what we hear or read." Mass persuasion, for example, is extremely difficult to pull off, and most attempts at it fail miserably, because when scaled up from two-person communication to large audiences, trust cues do not scale up accordingly. Most preachers, prophets, and demagogues fail, but because of the availability bias we only remember the biggest names in the genre, such as Jesus and Hitler. But even these examples fail upon further inspection. In his own time Jesus was a disappointment at starting a new religion (which might not have been his mission in any case), and even the apostle Paul barely got Christianity rolling. It wasn't until the 4th century that Christianity began to number in the millions, which sounds impressive until we consider the power of compound interest, in which a small but steady growth can yield an enormous figure given enough time. Invest $1 at a constant yearly interest rate of 1% in the year 0, if the dividends are reinvested by the year 2020 the investment would be worth over $2.4 billion. Mercier cites statistics compiled by the sociologist of religion Rodney Stark, who estimates Christianity's growth rate at 3.5% over the centuries. If each Christian only saves a few souls in a lifetime the religion could easily compile tens of millions in a matter of a few centuries, and over two billion by today. Perhaps this is why the dismal conversion rate of, for example, Mormon missionaries on their two-year missions, is not a concern for the church, as the success rate can be small if the process goes on long enough (coupled to high birth rates, of course, which most religions encourage).

As for Hitler, Mercier presents compelling evidence revealing that most Germans did not accept Nazi ideology, nor most of the planks in the regime platform, and even the anti-Semitism so famously on display in Hitler's writings and speeches was only effective on Germans who were already anti-Semitic. The euthanasia of the handicapped in the 1930s was resisted by most Germans and got so much bad press that the Nazis made the program secret and issued orders to never speak of it, a policy carried through the Final Solution and the Holocaust, which was shrouded in secrecy and mostly carried out in Poland, far from the prying eyes of German citizens. Hitler's anti-communism appealed to right-leaning Germans but was rejected among industrial workers. By 1942, most citizens did not believe the declarations of victory issued by the propaganda minister Joseph Goebbels, instead relying on secreted BBC reports of how the war was really going for Germany (not well). As the Nazi intelligence agency Sicherheitsdienst (SD) reported: "Our propaganda encounters rejection everywhere among the population because it is regarded as wrong and lying."[22]

To the commonly asked question "How could so many highly educated, intelligent, and cultured Germans become Nazis?" the answer is: "Most didn't." The entire regime—not unlike the Soviet Union and North Korea—was held aloft on *pluralistic ignorance*, in which individual members of a group don't believe something but believe that most others in the group believe it. When no one speaks up—or are prevented from speaking up through state-sponsored censorship or imprisonment—it produces a "spiral of silence" that can transmogrify into witch hunts, purges, pogroms, and repressive political regimes. This is why totalitarian and theocratic regimes restrict speech, press, trade, and travel, and why the route to breaking the bonds of such repressive governments and ideologies is free speech, free

press, free trade, and accurate and trustworthy information.

In a wide-ranging conversation for my Science Salon podcast, I asked Mercier directly, "are we living in a post-truth era?" His answer was clear:

> In many ways it's better than it's ever been, in that people are more informed than they used to be, and because of that they tend to be more consistent in their points of view. Fake news, for example, is a very marginalized phenomenon. Only a few percent of Twitter or Facebook users actually saw or spread fake news, and it doesn't appear to effect those who see it. But everyone has heard of fake news, so on the whole I think the information environment is improving, slowly and perhaps not as much as we would like it to be, but I think things are better than they used to be. People still want accurate opinions and they care about the truth. Even people who support Trump—studies show when you show them that something about Trump is fake news they accept that, even while maintaining their support for Trump.

In one of my final *Scientific American* columns I coined my own neologism in the Colbert tradition: *Factiness*, or the quality of something seeming to be factual when it is not.[23] But how do we know when something is factual and not factiness? We employ science and reason! There is progress in science and culture, and some ideas really are better than others. The post-Enlightenment ideal that beliefs should be tested in the laboratory and marketplace of ideas with the goal of generating objective and disinterested knowledge may seem Sisyphean, in that we are always in danger of backsliding into truthiness and factiness in which propaganda, superstition, and self-serving sophistry can slow our progress in pushing the boulder of knowledge up the mountain of ignorance, but that is precisely what we've been doing for millennia.

Per aspera ad astra—with difficulty to the stars. **S**

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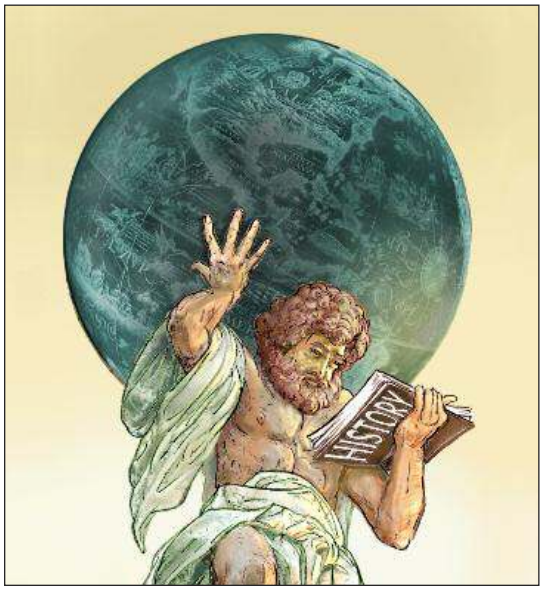
Can We Ever Explain It All?

Eight Key Points from World History

BY CHRIS EDWARDS



World history is not *a* subject; it is *all subjects*. As soon as the world historian starts asking questions about why peoples in different geographic regions developed differently, she will find herself asking questions about the motivations of individuals, the actions of groups, the patterns of disease, climate, geography, and even the historical effects of continental drift; this pursuit necessitates an understanding of psychology, sociology, biology, geography, climate science, and geology. World historical questions have no respect for disciplinary boundaries, which is why the field attracts polymaths.

However, because world history is so big of a topic that it defies specialization, the topic fits uneasily in the academy, where specialization is the norm and where "history" usually works with clear research questions that are defined within the parameters of specific geographical regions and historical eras. This uneasiness is why world history developed, first, outside of universities and it also explains why the field has developed so many varied approaches and has become so popular. My fascination with world history and its development led me to write the newly completed two-volume work titled *To Explain it All: Everything You Wanted to Know About the Popularity of World History Today*. World history is a big topic, but a few key points can be made about the field's foundations, its purpose, and its importance.

The two volumes of *To Explain it All* analyze the various approaches to world history. Those include the single-volume approach, the multi-volume approach, a children's history of the world, a humorous approach, a commodity-based history of the world, and histories that try to tell the narrative of world history through Islamic, non-western, and Marxist points of view, and even through the perspective of a political scientist. After reviewing the literature, here are some general principles I distilled about world history:

I. **The Greek historian Polybius (264-146 BCE) once wrote that the traditional historical method "omits events in parallel," and thus a more universalist approach is sometimes needed.** For example, a traditional historian might ask why legal slavery ended in the United States. This question would lead to a reference of Lincoln's 1863 Emancipation Proclamation and the 13th Amendment that was ratified in 1865. This form of analysis, however, misses that fact that Czar Alexander II freed the Russian serfs on February 19, 1861, during the first year of the American Civil War. That both the United States and Russia had legal slavery in 1860 but that neither had it by 1865 leads to a broader question: why was slavery almost entirely eradicated in the northern hemisphere over the course of just five years?

World history also allows for broadscale analogical analysis. Comparing, say, the outbreak of World War I with the Cuban Missile Crisis yields

several similarities. In each case a small region (Serbia and Cuba, respectively) was the subject of controversy between major powers. In each case an ultimatum was presented, and in each case weapons of mass destruction (machine guns in 1914, nuclear weapons in 1962) were available. Why did war break out in one case but not the other? The answer must involve the differences, one of which is that in 1914 no fast means of communication between the big powers was available as the first international phone call was not made until 1915. However, in 1962, the Americans and Soviets could communicate rapidly, which decreased the likelihood that a misunderstanding could lead to hostilities.

II. **H.G. Wells not only wrote science fiction, he should be considered the founder of world history.** Wells' 1920 *The Outline of History* is the first true "world history" because the Americas are included in the narrative. In about 1,000 pages of text, Wells attempts to "explain it all," and in the process he wrote World History's equivalent of Darwin's *Origin of Species*. *The Outline of History* is not just a foundational text, but a great work of skepticism. Wells dismisses the racist pseudosciences of his time and analyzes the source works of history with a critical eye. His one-volume approach is often march-across-the-desert boring but reaches sublime heights often enough to make for compulsive reading; it encapsulates everything about the subject almost perfectly.

III. **The subject of world history is too big to fit a traditional historical approach.** The traditional process of history asks a research question with specific boundaries and then exhausts the evidence in pursuit of answering that question. Arnold J. Toynbee (1889-1975) first tried the exhaustive approach, but Will and Ariel Durant popularized it with their eleven-volume *Story of Civilization* between 1935 and 1975. The Durants seemed to be possessed by graphomania, and after several decades of writing they died with their narrative stuck in the Napoleonic era. Currently, Susan Wise Bauer is three-volumes into a work of scholarly genius, but her narrative has just arrived at the era of the printing press (when modern history really begins), and its not clear that she can finish in her lifetime.

IV. **We should not let political correctness nor respect for religion cloud our historical judgment**. In 1928, the Soviets commissioned the director Sergei Eisenstein to make the movie *October* for the purpose of telling the history of the Russian Revolution. The history as presented in that movie fits the needs of the current power structure, and even though 1928 was just a few years removed from the Revolution, *October* is rife with distortions and fabrications. The Lenin of *October* is a cinematic, not a historical, character. In the same way, historians must view Jesus, Mohammed, and Genghis Khan as literary characters who were created at a specific time by a ruling class that needed an origin narrative.

In the case of Islam, the Arabian Peninsula must have pulsed with military potential for centuries before the Arabs marched across North Africa and the Middle East in the 630's. When the conquests began, Mohammed was not there and the *Qu'ran* was not written. Only after two decades of conquest was the *Qu'ran* composed, and Mohammed's biography was not created for over a century after these conquests. World historians often cite "Islamic tradition" when writing about the life and times of Mohammed, but Islamic tradition is less verifiable as history than the movie *October* was.

Clearly, something happened in the seventh century that caused the Arabs to conquer outside of their peninsula. However, it is more likely that the Bedouins had raided north many times before the 630s but had bumped into the Byzantine and Persian Empires at a time when those empires possessed real military strength. The Arabic conquests of the early 7th century occurred at precisely the moment when the Byzantines and Persians found their societies and militaries exhausted from decades of warfare with each other. This, more than a unifying religion, is probably the main cause of Arabic military success. Then, when the Arabs conquered and found themselves in contact with monotheisms, Mohammed and Islam were born as a literary tradition and as a legal code for governing an empire. Those religious traditions reflect the needs of rulers from the late 7th and early 8th centuries, not the actual events of the early 7th century.

The Genghis Khan we all think we know, too, is not a poor child of the steppes who killed his brother as a child and then won a civil war to unite the clans. Rather, this Genghis Khan was invented by later and literate Mongol rulers in the late 13th and early 14th centuries, and through a document titled *The Secret History of the Mongols*,

they created the character of Genghis Khan because he suited their needs for an origin story.

The differences between Christianity and Islam, in terms of the relation of church/mosque and state, are really about how they intertwined with the power structure. When the Roman Emperor Constantine (r. 306-337) elevated Christianity, he seemed only to know that the religion featured one god, and this fit his desire to have an empire with "one God, one emperor." Because Christianity was already three centuries old and had a core message of sorts, certain aspects of the faith did not fit well with the power structure; hence the separation of secular and religious powers that developed. Mohammed and Islam were both created from whole cloth to establish a religion/political power that suited the needs of 7th and 8th century Arabs who suddenly found themselves ruling an empire roughly the size of Rome at its height. No historical veracity at all should be given to the gospels, Islamic tradition, or *The Secret History of the Mongols*. Too many world historians cite religious traditions as being facts in the same category as, say, the 2008 election of Barack Obama, and this causes confusion.

V. **World history is about Western Civilization in the same way that Shakespeare's *Hamlet* is about Hamlet.** The University of Chicago's William H. McNeill (1917-2016), developed world history into an academic field, but began his historical career by writing about the "rise of the West" and he never shied from making the West world history's protagonist. Neither, it should be said, did any other writer of world history until very recently.

Western civilization is the main character of world history, and any attempt to tell the narrative of world history from any other perspective falls into the same kind of problem that trying to make *Hamlet* about Ophelia would. Given what you know about Ophelia, you can't make sense of her actions without knowing what Hamlet is doing. Likewise, nothing about world history after 1450 can make sense unless the narrative focus is on Western civilization because all the societies outside of the West were having to react to the West.

Along those lines, world historians and political scientists need to understand that we should not call democracy, accountable government, science, free markets, and guaranteed freedoms "Western values." These are universal values that just happened to develop in the West.

The Chinese government has, routinely, snuffed out democratic movements in their country. The Saudi government prevented women from being able to drive until very recently. There are no people in the United States who are protesting to jettison the Constitution and establish a one-party Communist state. There are no women in the United States who are protesting to have the right to drive taken from them.

The universal model that happened to develop in the West is superior to other governmental models. That case was first made by Francis Fukuyama with his 1992 book *The End of History and the Last Man*, and was essentially proven by Acemoglu and Robinson in their book *Why Nations Fail: The Origins of Power, Prosperity, and Poverty* (2012). Both Steven Pinker and Michael Shermer make empirical cases that the world is getting better largely because of the spread of a universalist (previously called Western) model.

VI. **However, we really need to talk about China.** China vexes modern political scientists because the Chinese seem to be developing a capitalist economy under a one-party political state with almost no democracy. Almost everyone who writes about China misunderstands why. In the second volume of his world history, *Political Order and Political Decay: From the Industrial Revolution to the Present Day* (2015), Francis Fukuyama wrote that modern China is better understood as being connected to the Han imperial past, with its Confucian values, than it is to any Communist orthodoxy.

Such statements cloud our analysis of China. First of all, modern China must be understood through Communist orthodoxy. When Deng Xiaoping (1904-1997) sought to institute capitalism after 1978, he did so by citing the New Economic Policy, which had been a policy of one-party control and the opening of free markets, first instituted by Lenin in the wake of the Red vs. White Russian Civil War. Everything that has happened in the Chinese economy since 1978 is justified by Leninist and Maoist doctrines.

Chinese Communism has not suffered the fate of the Russians for three core reasons: (1) The Russians had a fascination with Western culture that the Chinese have never shared. In the 1960s and 1970s, when Soviet teenagers shimmied to bootlegged copies of the Beatles while shunning the geriatrics in control of the government, Chinese teenagers shunned the Beatles

and went wild over Mao instead. (2) The Chinese will never have a Gorbachev. American policy analysts give the American-led "arms race" too much credit for splintering the Soviet Union. In pursuit of nuclear weapons, both the Pakistanis and the Chinese forced serious deprivations on their people in the 20th century. By trying to reform the Soviet model, Gorbachev facilitated its destruction. No one like Gorbachev will ever be the head of the Chinese Communist Party. (3) The traditional political science theory regarding state power and capitalism has it that capitalism creates a middle class that then pressures the government for economic reform. If a state is successful in creating top-down capitalism, then it will create the class that destroys single party dominance. How is the Chinese Communist party simultaneously creating a middle class and preventing democratic political reform? The answer is that *they are not doing this*. Instead, the Chinese government outsources well over a million educated engineers and entrepreneurs into Africa and Pakistan. The former is occurring at such a scale that the journalist Howard W. French calls Africa "China's Second Continent" (the title of his excellent 2014 book).

VII. "Big History" is a derivative of World History. Big History is a result of the overlap between the sciences and history that really began with William McNeill's 1961 textbook *A World History*. A revered professor at the University of Chicago, McNeill was one of the only world historians to practice from inside a traditional academic structure. From McNeill, David Christian conceived of "Big History" that is, as McNeill wrote in his introduction to Christian's 2005 book *Maps of Time: An Introduction to Big History*, a book that "unites natural history and human history in a single, grand, and intelligible narrative" (xv).

VIII. The world is becoming a Femocracy and this will be (mostly) good. The most impressive effect of democracy has been to facilitate the development of feminism. In the year 1919, women in the United States had no federally-guaranteed right to vote, and tens of millions of women in China still had their feet broken at a young age and bound tightly so that they would be physically and socially crippled for life. In 2019, neither of these was true. Historians like to focus on political developments, treaties, etc., but, given the overwhelming rise of feminism since the late 18th century, everything else should be seen as a sub-subject to the rise of women.

More important than the 1776 American Revolution, or the 1789 French Revolution, was the 1792 publication of the feminist polemic, *Vindication of the Rights of Women* by Mary Wollstonecraft. The year 1848 saw lower-class revolutions across Europe and the publication of the *Communist Manifesto*, but the significance of both means almost nothing next to the *Declaration of Sentiments* that was written in Seneca Falls, New York (first line: "*We hold these truths to be self-evident that all men and women are created equal*.") It could be argued that neither WWI nor WWII were as important for the 20th century as the development of the birth control pill. Enlightenment philosophy and democratic institutions allowed for the rise of feminism. The spread of Femocracy—the combination of democratic institutions and women's rights—is the story of the modern world.

No single narrative or approach can ever "Explain it All," but world history remains the best place for thinkers to develop cross-curricular analogies, and that means that world history is most useful as an educational tool. It is the only subject best suited for polymaths rather than specialists. Instead of trying to create a single narrative to be presented to students and the public from the top-down, world history should be a flexible discipline that allows for cross-curricular thinkers to see connections across disciplines from the bottom-up. World history would then be what it has always been, the perfect subject for people who are interested in all the subjects. S

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Countless Counterfeits

A New Logical Fallacy?

BY DAVID KYLE JOHNSON

Lists and descriptions of logical fallacies, which exist both on and offline, are numerous. They are in logic textbooks, on Wikipedia, have dedicated websites (like yourlogicalfallacyis.com and logicallyfallacious.com), and even dedicated books—like *Bad Arguments: 100 of the Most Important Fallacies in Western Philosophy* (edited by Robert Arp, Steven Barbone, and Michael Bruce [Hoboken, NY: Wiley-Blackwell, 2018]). Our collective list of logical fallacies is the end result of the efforts of numerous philosophers, all carefully thinking about the many ways that reasoning can go wrong. Consequently, it's difficult to discover a genuinely new fallacy—to identify a common mistake in reasoning that no one has officially identified and named. I would like to humbly argue, however, that I may have recently done just that.

Now, to be clear, I don't mean to suggest that I have invented a name for a variety of a logical fallacy that already exists. I did that when I tried to coin the phrase "mystery therefore magic" (in an article for *Scientia Salon* on the conflict between religion and science) to describe the mistake of concluding that something must have a supernatural explanation if it has yet to receive a natural one. "How did that happen? It's a mystery! Therefore, it's magic." This is simply a variety of appealing to ignorance, where one takes a lack of proof that something is false as a reason to conclude it is true. In this case, the inability to find a natural explanation for a claim is seen to be reason to conclude that it is magic. (It also invokes the argument from personal incredulity: "If *I* can't explain it, then it must be inexplicable.") I think it is useful to give this particular variety of appealing to ignorance its own name; this particular mistake is very common and "*mystery therefore magic*" is easy for students to understand and remember. But in doing so, I did not identify a *new* fallacy.

But I do believe I did so when, in the aforementioned *Bad Arguments* book (pp. 140-144), I identified and described a fallacy I called the "*Countless Counterfeits*" fallacy. I was inspired by an encounter with a former colleague of mine with whom I was discussing the existence of UFOs. As I recall the conversation, he mentioned a couple of stories that he thought were remarkable, but which I knew had been debunked. "Roswell was Project Mogul," I said. "The Phoenix Lights were flares." His reply (again, as I recall) was made as he held a book of *close encounters* he had bought at a library's used book sale we were both attending. "Ok, but there are so many other UFO stories out there; they can't all be false. And if just one of them is legit, aliens exist." I was taken aback. I knew something was wrong with his argument. Indeed, there had to be. After all, I could say the same thing about the number of ghost, Bigfoot, and Nessie sightings—and I knew he didn't believe in any of that. But still, I couldn't identify exactly what the mistake was.

One might be tempted to think the error is akin to stacking up anecdotes, and I could have just said "the plural of anecdote is not data." But this doesn't seem to be the mistake. He's not thinking that a bunch of debunked UFO stories can be *combined* to

form one legitimate one. His mistake was also not a variety of an appeal to popularity. "A million UFO true-believers can't be wrong." He also wasn't pointing to any specific yet to be explained story and saying, "Maybe you have explained others, but you can't explain *this* one, so it's aliens." (That would be akin to the *mystery therefore magic* fallacy.) He didn't even have a specific story in mind. And his mistake is not a matter of failing to embrace the simplest explanation, either. After all, he likely thinks the simplest explanation for that one good story he thinks is out there is "it's aliens."

The key to unraveling this mystery came when I realized that he wasn't being literal when he said, "they can't all be false." Of course, such stories *could* all be false; that is *possible*. But if I would have pointed that out, he would have simply said that he only meant to suggest that such a thing was *unlikely*: UFO sightings are so numerous, it's *improbable* that that they are *all* bogus. And then it hit me: the mistake is one regarding probability. But it's not the *gambler's fallacy* (thinking that one chance occurrence can affect the probability of others). It's a mistake about how probability relates to evidence. As I put it in my original "Countless Counterfeits" entry for the *Bad Augments* book:

> The true believer mistakenly thinks that whether or not a piece of evidence is good is a matter of chance, so that the more pieces of evidence there are, the more likely it is that one is reliable. "Throw the dice long enough and eventually you'll get a Yahtzee." But this is not how evidence works. I can't pile up 1000 pieces of bad evidence that you committed a murder and claim it's likely that one proves you did. Whether a piece of evidence is good is not a matter of chance; it either is or it isn't. (p. 142)

A large collection of bad evidence isn't bound to have some good evidence in it somewhere because whether a piece of evidence is faulty is not a matter of luck.

For the name *Countless Counterfeits*, I was inspired by another academic who committed this fallacy named Peter Kreft. In an article on Catholic belief in ghosts (by Tim Townsend) in the magazine *U.S. Catholic*, Kreft argued that the large number of debunked ghost stories was reason to believe that ghosts are real. To demonstrate his logic, he gave an analogy: "The existence of [a great deal of] counterfeit money strongly argues for the existence of real money somewhere." The countless number of counterfeit (fake, false, faulty, fraudulent) ghost stories was, to him, evidence that ghosts are real because, in the end, *they can't all be fake!*

The mistake goes even deeper, however. Notice that, not only *could* they indeed all be fake—but they *very likely all are*. Given how gullible humans are, and given how easily fooled our senses are, and given how faulty our memory is, it is no surprise that a great number of such stories exist. A bunch of stories about people seeing UFOs is not a reason to think that at least one is real; it's confirmation of what we already knew: people are easily fooled.

Indeed, the more such stories are debunked, the more reason I have to for thinking that *none* are legitimate. If a young boy, for example, set out to figure out whether magicians have magic powers, he would not have to figure out very many tricks before he was justified in believing that all magic is just trickery (e.g., illusion and sleight of hand). Once he has debunked a few, he has effectively debunked them all. And it matters not how many other magicians are out there that the boy has not ever heard of, or even whether there are tricks that he can't figure out. He now knows they are all using naturally explicable methods. In the same way, once you find natural explanations for enough ghost stories and UFO sightings, you have good reason to believe that there is a natural/earthly explanation for them all. At the least, the burden is on the other side to show that there is not. Most certainly, the large number of such stories is not reason to think that one is legitimate.

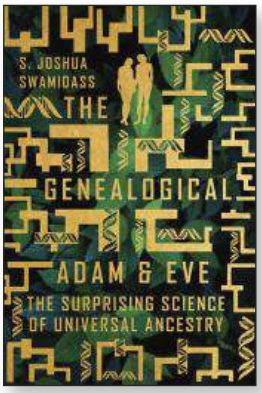
The same works for arguments too. There is a large number of arguments for God's existence, for example. There's the cosmological, the ontological, the teleological, the moral, etc.—and there are many varieties of each. Rebecca Newberger Goldstein, in her book *36 Arguments For The Existence of God* has identified…well…at least 36. Now, obviously, if each fails individually (as Goldstein argues they do), you can't combine them to form one good argument. (That could be called the "combining faulty arguments fallacy.") But you also can't look at the sheer number, before you examine them, and say "It's unlikely that they all fail. And if just one works, God exists." Whether arguments work is not a matter of chance either, so you can't rightly think that a large number of arguments to the same conclusion is a good reason to think that conclusion is true.

I may be wrong, but as far as I know, no one has ever identified this particular mistake in reasoning. I'm even more certain that no one has given it a name. And in my humble opinion, it needs one. Countless Counterfeits is, I believe, behind a host of people's belief in UFOs, ghosts, demons, alternate medicine cures, and even grandiose conspiracy theories. And as I am sure readers of Skeptic will agree, all such beliefs need to be relegated to the dust bin of history. S

Leaving the Garden

A review of *The Genealogical Adam and Eve: The Surprising Science of Universal Ancestry* by S. Joshua Swamidass

REVIEWED BY TIM CALLAHAN



IVP Academic/InterVarsity Press.
2019. 264 pp. $27.
ISBN-13: 978-0830852635

More than anything else, this book illustrates the futility of attempting to either shoehorn the Bible into science or science into the Bible. To his credit S. Joshua Swamidass seems to be attempting more to make evolution palatable to evangelical Christians than to attempt to convert scientists and secularists to Christianity.

Dr. Swamidass's basic thesis is that, while humans evolved over hundreds of thousands of years from australopithecines, as evolutionary science and theistic evolutionists assert, God created Adam and Eve supernaturally from dust in the Garden of Eden. Despite this miraculous origin, Adam and Eve were not genetically different from the divinely *evolved* humans outside the garden. Thus, their offspring were able to interbreed with the outsiders (solving the troubling question of where Cain found his wife) and spread their genes through the entire population. This thesis not only makes all of us their genealogical descendants, but as well conferred on all of us the curse of original sin.

Swamidass devotes much of the book to describing genealogical descent, and points out that one might have a biological ancestor that has bequeathed a son or daughter almost no genetic inheritance. How? A child inherits half its genes from each parent, but only one quarter of its genes from any of its grandparents and only one eighth of its genes from any one of its great-grandparents, and so on. Thus, it is possible for Genghis Khan to be the ancestor of one in every 200 men living today without any of them inheriting much more from the feared conqueror than his Y chromosome. Swamidass states (p. 10):

> Entirely consistent with the genetic and archeological evidence, it is possible that Adam was created out of dust, and Eve out of his rib, less than ten thousand years ago. Leaving the Garden, their offspring would have blended with those outside it, biologically identical neighbors from the surrounding area. In a few thousand years, they would become genealogical ancestors of everyone.

That Adam, Eve and their descendants were biologically identical to the evolved humans, of course, makes any detection of the supernaturally created genes impossible. Swamidass continues (p.12):

> Much like the Virgin Birth of Jesus, there is no evidence for or against the *de novo* creation of Adam and Eve, ancestors of us all, a historical couple who lived recently in the Middle East.

There being no evidence one way or the other means that this hypothesis in untestable. Hence, it is not science. This makes the subtitle of the book, *The Surprising Science of Universal Ancestry* evidently untrue: If it can't be tested it's not science. Nevertheless, Swamidass makes six propositions about Adam and Eve (pp. 24-26):

> 1. *They lived recently in the Middle East.* Adam and Eve are situated in recent history, perhaps as recently as six thousand years ago, and in the Middle East. We can explore if and how the evidence constrains where they could be located.
>
> 2. *They are genealogical ancestors of everyone.* By AD 1, Adam and Eve are a couple from whom all humans across the globe descend. In the distant past, at some point before AD 1, there would be biological humans alive that do not descend from them.
>
> 3. *They are* de novo *created.* God creates Adam and Eve by a direct act, *de novo* from dust and a rib (or Adam's side). We have not specified the ways Adam and Eve are the same or different from those outside the Garden, but some constraints will arise. This proposition is not required, and it might be dropped if required by the evidence or disfavored in theology,
>
> 4. *Interbreeding between their lineage and others.* Adam and Eve's lineage eventually interbreed with people outside the Garden. Adam would be the same biological type of those outside the Garden, with no biological advantages over everyone else.

To scientifically assess this hypothesis, however, we need add two more propositions:

> 5. *No additional miracles allowed.* No appeals to divine action are permitted to explain the data or increase confidence in the hypothesis. Yes, one direct act of God is included in the hypothesis itself, but the evidential evaluation of the hypothesis cannot infer or rely upon divine action in any way.

We will also add this proposition about the people outside the Garden, which will fill in poorly specified details of the traditional account.

> 6. *The two findings of evolutionary science.* The people outside the Garden would share common descent with the great apes, and the size of their

> population would never dip down to a single couple.

I find proposition number 5 above to be particularly telling. Swamidass is against any appeal to divine fiat, *except for the miracle at the core of his hypothesis*. That this is not science is further evidenced when Swamidass explains why we will never find any evidence of Adam and Eve (p. 79):

> Paradoxically, Adam and Eve could have been created from the dust and a rib, without parents, and at the same time we all could also share common ancestry with the great apes. These two facts are not in conflict. There is no evidence against the *de novo* creation of Adam. Our genomes would appear as if we shared ancestry with the great apes, because we do. This evidence would not imply God was deceitful, because genomes would record the true story of everyone outside the Garden. The genetic evidence that we descend from Adam and Eve, however, would be lost long ago. For this reason, there is no genetic evidence for or against the *de novo* creation of Adam and Eve.

So, there's no evidence against the creation of Adam from dust and Eve from his rib. However, there's also no evidence for this divine fiat. Ergo, there's no evidence, period. There being no evidence of this miraculous creation this hypothesis has all the substance and sustenance of cotton candy.

If there's no scientific evidence of any difference between the evolved humans and the miraculously created Adam and Eve, in what way were they different? Here Swamidass invokes a special definition of what it means to be human: Adam and Eve were, in addition to being biologically human, *textual* human beings; i.e., they were mentioned in the scriptures (p. 134). Swamidass uses this difference to explain the contradictions between the two creation stories in Genesis 1 and 2. In Genesis 1, human beings are created as male and female (Gen. 1:26-28). In Genesis 2, God first makes Adam out of dust, then creates all the animals, then makes Eve out of Adam's rib. Swamidass asserts that Genesis 1 refers to the evolved humans outside the garden, while Genesis 2 tells of the creation of Adam and Eve (pp. 135 and 140). Ergo, there's really no conflict between the two. This is neat, pat and completely untestable. The author also states that Genesis 4 suggests that there were other people outside the garden (p. 136), answering the question of where Cain got his wife, since he and Abel were the only two children of Adam and Eve.

This vague hint of those evolved humans would seem to be rather thin scriptural evidence of the evolved humans. However, Swamidass invokes another group of humans as the humans created by God through evolution, namely the Nephilim. In the King James version of the account of this people, the Nephilim are referred to as giants (Gen. 6:1-4, bracketed material added):

> And it came to pass, when men began to multiply on the face of the earth, and daughters were born unto them, that the sons of God saw the daughters of men, that they were fair and they took them wives of all which they chose. And the LORD said, "My spirit will not always strive with man, for he is also flesh; yet his days shall be a hundred and twenty years." There were giants [*Nephilim*] in the earth in those days and also after that, when the sons of God came in unto the daughters of men, and they bare children unto them; the same became mighty men which were of old, men of renown.

Swamidass asserts that the Nephilim were the offspring of the children of Adam and Eve with those of the evolved humans (pp. 144, 145). This is a variation on what was known as the Sethite Theory, which emerged in both Christianity and Judaism in the second century CE. The "sons of God" are elsewhere in the Bible understood to refer to angels, as in the Book of Job when God speaks of how he laid the foundations of the earth, and (Job 38:7), "when the morning stars sang together and all the sons of God shouted for joy." However, angels having sex with human women, upon whom they sired, "mighty men which were of old, men of renown," was too close for comfort to pagan mythology in which gods sired heroes—such as Heracles and Perseus, both sons of Zeus—on mortal women. Thus, early Christians and rabbinic Jews interpreted the "sons of God" in Genesis 4 as referring to the godly line of Seth, the third son of Adam and Eve, and the "daughters of men" as seductive hussies of the ungodly line of Cain.

Swamidass makes the "sons of God" into descendants of Adam and Eve, the daughters of men as descendants of the evolved humans from outside the Garden of Eden. Since the material on the Nephilim is scripturally miniscule and the interpretation of the Nephilim as anything other than descendants of angels and mortal women, even scriptural support for Swamidass's hypothesis is thin.

Considering that the scientific evidence for the miraculous creation of Adam and Eve doesn't exist and scriptural support for it is thin at best, one wonders what reason Swamidass could have for insisting that Adam and Eve were real people. The answer to this question lies in the Christian doctrine of Original Sin. The fall of man, in Jewish terms, is how the human race lost immortality. As such, the myth of Adam and Eve eating the forbidden fruit is one form of a myth common to all ancient peoples, the myth of why we die. In all forms of this myth human beings as originally created were, at least potentially, immortal. So, there had to be a specific reason why death came into the world. The Christian reworking of the myth was that not only were humans doomed to die, but were born in a sinful state, inheriting Adam's sin by way of biological descent. Thus, unless saved through Christ's substitutiary atonement—him dying on the cross in our place, then rising from the dead—humans are damned. The importance for Swamidass of all of us being descendants of Adam and Eve, through interbreeding with evolved humans, is that they conferred on us all Original Sin. Swamidass's Adam and Eve hypothesis, then, is a theological argument, not a scientific one.

Swamidass's attempt to reconcile the creation of Adam out of dust and Eve out of Adam's rib with human evolution and

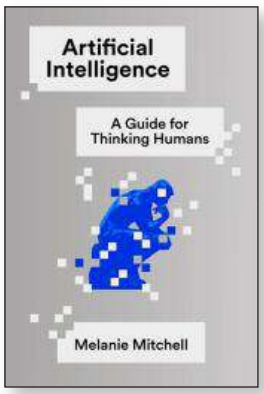
descent from the higher primates is reminiscent of what is called the day–age theory. This is the interpretation, by old earth creationists (among others), of the six days of creation in Genesis 1 as referring to ages of the earth's history. Just as there are six *days* of creation, there are six *eons* of Earth's history: Hadean, Archaeozoic, Proterozoic, Paleozoic, Mesozoic and Cenozoic. The problem with such an equating of days with ages is that the last three "days"—the Paleozoic, Mesozoic and Cenozoic—comprised between them a bit over half a billion years; while the entirety of Earth's history is about 4.5 billion years. Thus, the last three day/ages between them comprise only 1/9 of Earth's history.

There is a long history of attempts to reconcile either science with the Bible or the Bible with science. These include Hugh Ross explaining the resurrected Jesus appearing suddenly in the locked room where his disciples are hiding (John 20:26) as Jesus moving through different dimensions and numerous attempts to find natural, scientific explanations for the ten plagues against Egypt in Exodus. Whether it's the day–age compromise, Jesus traveling through different dimensions, scientific explanations for the miracles of Exodus, or Swamidass's attempt to reconcile Adam and Eve with human evolution, attempts to fit science into the Bible or the scriptures into science do violence to them both. S

Ten Years Away… and Always Will Be

A review of *Artificial Intelligence: A Guide for Thinking Humans* by Melanie Mitchell

REVIEWED BY PETER KASSAN



Farrar, Strauss and Giroux, 2019. 336 pp. $28.
ISBN 13:9780374257835

There are a lot of books about artificial intelligence. The interlibrary site Worldcat lists over 36,000. Amazon claims to have over 20,000 for sale. Many contain histrionic titles, such as *Life 3.0: Being Human in the Age of Artificial Intelligence; You Look Like a Thing and I Love You: How Artificial Intelligence Works, Why It's Making the World a Weirder Place;* and especially *The Age of Spiritual Machines: When Computers Exceed Human Intelligence.* Melanie Mitchell's new book is more modestly titled, but it is, in my opinion after surveying much of this literature, the most *intelligent* book on the subject. Mitchell is Professor of Computer Science at Portland State University as well as External Professor and Co-Chair of the Science Board at the Santa Fe Institute. And, unlike most active practitioners in the field, her evaluation of the current state of AI and its prospects is measured, cautious, and often skeptical.

The book begins with an introduction ("Prologue: Terrified"), a personal story of how she became involved with AI, inspired by Douglas Hofstadter's *Gödel, Escher, Bach: An Eternal Golden Braid*. Through a mixture of luck, audacity, and persistence, Mitchell first became Hofstadter's research assistant and then a doctoral student under him. Decades later, in 2014, at a Google conference she attended with him, she learned that Hofstadter was upset that one AI program has defeated the world chess champion and another has generated a music "composition" indistinguishable from (even judged better than) a genuine composition by Chopin. Hofstader's concerns inspired her to write about the pursuit of human-level AI (and beyond).

The book is divided into five parts: Background; Looking and Learning; Learning to Play; Artificial Intelligence Meets Natural Language; and The Barrier of Meaning. Although Mitchell states up front that the book isn't intended to be a general survey or history of AI, she still manages to tell enough of its history—especially of its hubristic inauguration in 1956 by John McCarthy, Marvin Minsky, Allen Newell, and Herbert Simon—to put today's enthusiastic optimism in perspective.

As Mitchell explains, one of the first branches in the pursuit of AI was artificial neural nets (ANN)—the foundation of today's deep learning algorithms. She provides an example of such an ANN, the "perceptron" designed to "learn" how to recognize hand-lettered digits. The illustrative grid is 18 x 18, and each square has one of four shades: white, light gray, dark gray, and black. Curiously, she doesn't mention the fundamental problem of even such a relatively modest ANN: the number of different possible inputs in this case is 2 to the 326th power (2^{326}), or:

> 136,703,170,298,938,245,273,281,389,194,851,335,334,573,089,430,825,777,276,610,662,900,622,062,449,960,995,201,469,573,563,940,864

Such a program is effectively untestable. (This is true for the even more limited 8 x 8 binary grid, which she discusses a little later in a different context. In that case, the number of possible cases is only 2 to the 64th power (2^{64}), or 18,446,744,073,709,551,616.)

This problem will come back to haunt today's astonishingly successful deep learning programs, as Mitchell

demonstrates in some detail later in the book.

Mitchell briefly discusses the famous Turing Test, which the seminal mathematician Alan Turing proposed in 1950 (calling it the Imitation Game) as a way to operationalize the troublesome concept of intelligence. This is equivalent to saying that NASA would have successfully landed on the moon if only it had done a better job of faking it, as some conspiracy theorists insist they tried to do. Mitchell points out how easily the Turing Test has been "passed" with naive testers using trivial chatbots, but doesn't herself pass judgment on the validity of the test itself.

In Part II, Mitchell addresses the difficulty of image recognition and machine learning—particularly deep learning. She begins with a black-and-white version of this photograph (Figure 1).

Figure 1—A richly detailed story-telling photograph. AI image recognition programs have difficulty interpreting it beyond recognizing that it contains a dog. U.S. Air Force photo by Airman 1st Class Erica Crossen.

Although there are a few recognizable entities in the photograph—a dog, a woman wearing a camouflage suit, a bouquet, a laptop, a Welcome Home! Balloon, a suitcase, an American flag, and so on—this photograph tells a *story*, which is why it was it deemed one of the 50 best military photos of 2015. No AI program in existence can even begin to make sense of it. For example, Microsoft's CaptionBot, which makes the claim that "I can understand the content of any photograph and I'll try to describe it as well as any human," fails repeatedly with this photograph, giving the excuse "I seem to be under the weather right now. Try again later." When I performed a Google image search on it, Google found only the dog. Having decided that, Google provided a huge number of "very similar" images, in which the only element in common was a dog.

This is just the introduction to Mitchell's deeper discussion of image recognition, how deep learning programs work, and the fragility of their apparent success. Apparently well-known in the AI community but little known outside of it (and to me), you can take a recognizable image and turn it to an apparently identical one that will be identified with great confidence by AI programs as whatever you like, including something entirely different. Mitchell gives several examples, including this pair (Figure 2). Perhaps even more stunning are the examples of TV snow and abstract geometric patterns identified (again, with great confidence) as specific entities (Figure 3).

As Mitchell concludes, this reveals that these image recognition programs *aren't learning what we think they're learning*.

For some reason, Mitchell places the chapter entitled "On Trustworthy and Ethical AI" here in Part II (Looking and Learning) rather than in the concluding section where it more properly belongs. The 13 pages she devotes are inadequate

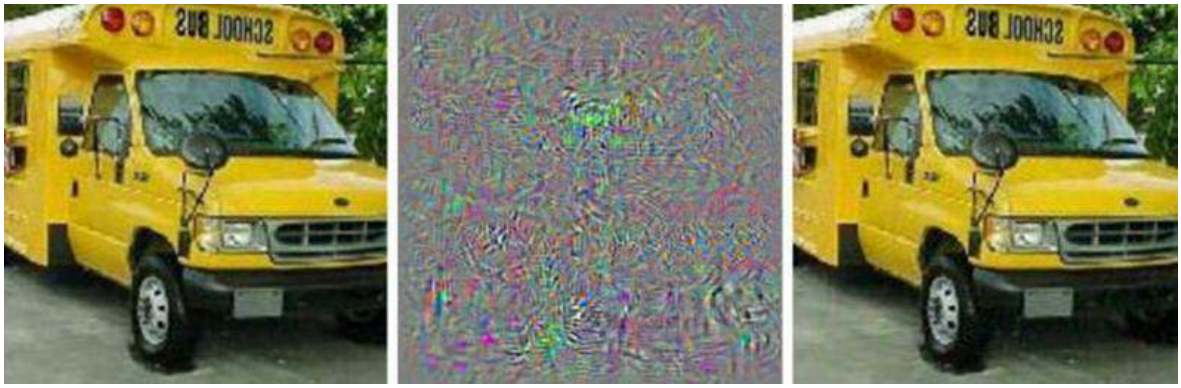


Figure 2: A recognizable image can be imperceptibly altered so that it will be misidentified by image recognition software. (Left): Original: photograph correctly identified as a school bus. (Center): Differences to be applied the original image to cause misidentification). (Right): Photograph apparently of a school bus incorrectly identified as an ostrich. (See "Intriguing Properties of Neural Networks" for discussion.)

for the subject, which is more thoroughly discussed even in Wikipedia—not to mention the hundreds of thousands of websites and even entire books.

In Part III, Learning to Play, Mitchell resumes both her enthusiasm and her mastery. Although this section is again rather short, her discussion of how robotic dogs have learned how to play soccer and computer programs have learned to play Atari, Chess, and Go is clear and informative. And, she's appropriately skeptical of the credulous enthusiasm fostered by such successes: "It may sound strange to say, but...the

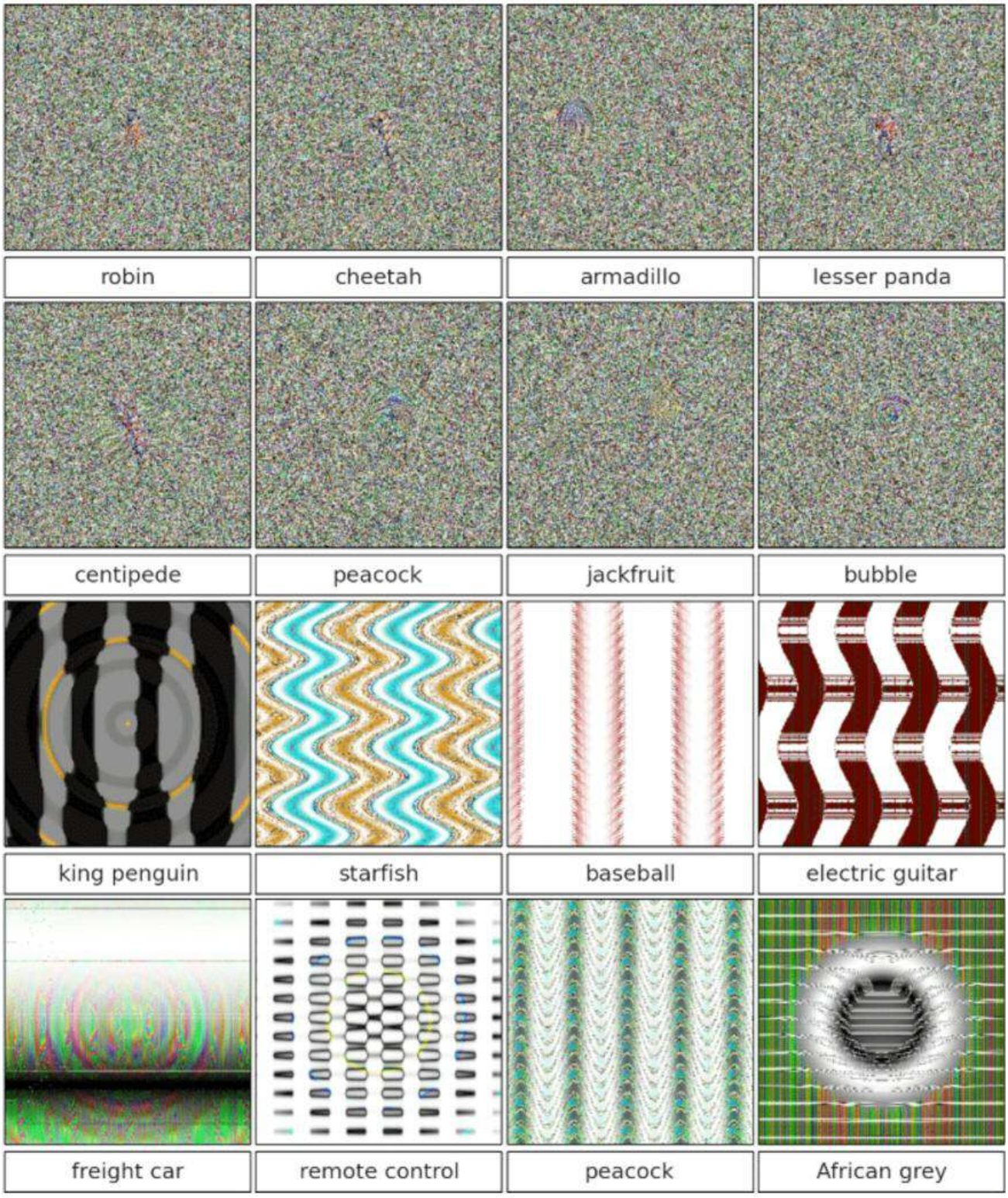


Figure 3: TV snow patterns and abstract geometric patterns identified by AI as specific objects.

lowest kindergartner in the school chess club is smarter than AlphaGo."

The boundary between Part IV, Artificial Intelligence Meets Natural Language, and Part V, The Barrier of Meaning, is arbitrary and superfluous, exactly because, as Mitchell is well aware, without meaning, language isn't natural. But her discussion of both subjects is knowledgeable, informative, and strong, particularly on the subject of analogies, the topic of her doctoral thesis (published as *Analogy Making As Perception: A Computer Model*).

Here, too, she's justifiably skeptical: "It seems to me extremely unlikely that machines could ever reach the level of humans on translation, reading comprehension, and the like exclusively from online data, with essentially no real understanding of the language they process. Language relies on commonsense knowledge and understanding of the world…. Does the lack of humanlike understanding…inevitably result in their being brittle, unreliable and vulnerable to attack? No one knows the answer, and this fact should give us all pause."

In the penultimate chapter, Mitchell reiterates the point she's been making throughout the book with a photograph that, like the soldier coming home, is beyond the comprehension of any AI program (the humor of President Obama adding pounds to the scale) (Figure 4)

Figure 4: A photograph used as an example of understanding beyond the comprehension of an AI program: President Obama surreptitiously adds a few pounds as a colleague weighs himself. Official White House Photo by Pete Souza.

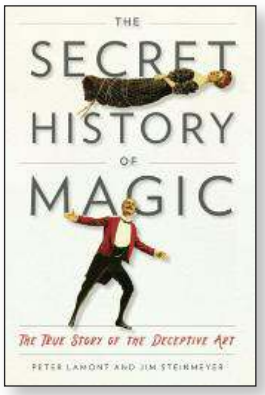
The final chapter, "Questions, Answers, and Speculations," is far less speculative than Mitchell pretends: "[T]he take-home message from this book is that we humans tend to overestimate AI advances and underestimate the complexity of our own intelligence. Today's AI is far from general intelligence, and I don't believe that machine 'superintelligence' is anywhere on the horizon."

Artificial Intelligence: A Guide for Thinking Humans is a highly readable explanation of both AI's recent impressive successes and its longstanding (and perhaps inherent) limitations, issues, and failures. Most remarkably, unlike skeptical outsiders like myself, its author has been actively working in the field for her entire professional life. S

It's Magic

A Review of *The Secret History of Magic: The True Story of the Deceptive Art* by Peter Lamont and Jim Steinmeyer

REVIEWED BY MICHELLE AINSWORTH



TarcherPerigee. 2018.
368 pages. $28.
ISBN-13: 978-0143130635

"*We have done what historians do: we have told a particular story, not the whole story…*" (ix)

Were magical entertainers persecuted as having real magic powers? How does theatrical magic relate to the history of science, technology, and psychology? Peter Lamont has previously written about the psychology of deception and paranormal history, while Jim Steinmeyer has written about early 20th century greats and is the leading expert on the mechanics of 20th century large stage illusion. They have combined their talents in their scholarly and lucid new book, *The Secret History of Magic*, which ranges from ancient times to the 21st century. Its endnotes cite current scholarship in multiple disciplines.

Their book is a thematic general

history. By downplaying biography, historical trends are clearer and are analyzed in more depth. Lamont's expertise in psychology shines as the authors effectively convey what is and isn't timeless in the appeal of magic tricks.

Fittingly, the book opens with a deception. Instead of perpetuating the myth of two alleged ancient Egyptian magic performances, the authors end up criticizing prior historians for taking them seriously. One, the tale of Dedi, or "Djedi", is from an ancient papyrus scroll of fables. The other is from the Bible, which they critique while introducing *The Secret History of Magic's* theme: that how magic is perceived depends on the context in which it is presented, whether as miracle, fraud, or good or bad entertainment.

From there they move to the allegations of persecutions of magical entertainers for supernatural powers, which mostly stop in the early 19th century. These stories, too, are debunked, primarily as based on a misreading of sources, even before the modern era: "From Plato to Augustine, we get the same picture of…audiences who were aware that they were being tricked." Lamont and Steinmeyer suggest that Reginald Scot's influential 1584 *Discoverie of Witchcraft* exaggerated prosecution claims as "rhetoric." Close reading of Scot, and of later alleged prosecutions, suggests that most criminal charges were for concurrent crimes, not for the performance of magic tricks by themselves. (Often, it was for the *claim* of having real magic powers). The myth of entertainers being prosecuted is buttressed by other evidence, such as the anti-witchcraft tract *Malleus Maleficarum* having a caveat in support of sleight of hand entertainers, and recently discovered evidence of a king infamous for his anti-witch zealotry hiring an entertainer specializing in legerdemain.

A chapter discussing magicians and the scientific revolution may be of particular interest to readers of Skeptic. Natural philosophers David Hume and Antoine Lavoisier, the printing press, and the premiere of the *Encyclopedia Britannica* all contextualize magicians beginning to market their entertainments as "rational recreation," using science (or scripts about science) to sidestep accusations of triviality.

Was "The Father of Modern Magic" another myth? No other magician receives more than a few pages in *Secret History*, making the two chapters on Jean Eugene Robert-Houdin stand out. The first is devoted to most of the performer and inventor's life and career, with the point that we remember him primarily due to his memoir, which falters under scrutiny. The authors largely agree with Houdini's infamous assessment that his namesake was not as pioneering in presentational content or style as is claimed in his memoir, and by most subsequent histories.

Did Robert-Houdin use theatrical deception to intimidate superstitious colonial subjects? The authors applaud the technology of electromagnetism, and presentational skill, of the trick he famously used in Algiers in 1856, but according to them it was likely only perceived as entertainment. First, his performance was in a modern theater, not spontaneous. Contrary to the memoir, there was no colonial rebellion going on in Algiers at the time, and diplomatic sources, not surprisingly, barely mention Robert-Houdin's performance. With these and other factors in mind, the authors conclude their discussion of Robert-Houdin with the statement that subsequent historians have read his memoirs uncritically because, as with some ancient tales, stage magicians wanted a founding myth.

Two chapters on magicians of the late 19th and early 20th centuries focus on the magic acts of traveling variety shows and the also new "great man" led full evening "illusion" shows. The authors note that neither could have developed without railroads. Large scale magic tricks go back to at least the 16th century, but were not common features of magic shows until three centuries later, and the technology which magicians used to create them is discussed. The use of women as on-stage assistants was new at this time, and came after the appearance of showgirls in other shows. The authors suggest that correlation is causation when noting that the iconic trick of the damsel in distress being sawed in half successfully debuted during the new silent film trend of women in peril (and as women achieved the vote in England and the U.S.). Houdini and other magicians of his age are mostly confined to these chapters.

Two chapters relate the paranormal to stage magic. One theme is how spiritual and scientific trends influenced and contextualized 19th and 20th century psychic entertainers. For example, mesmerism influenced spiritualism and psychic phenomena. All three are analyzed as being more plausible in an age in which long distance transmission of sound was new, and psychology was just emerging as a discipline. Stage magicians borrowed from each of these, including secretly using radio technology to simulate mindreading. The book's theme that context influences perception is repeated: in the middle of a magic show, a mind reading trick will be perceived less seriously than when the same trick is performed in a laboratory.

A chapter on the history of small scale sleight of hand, absent from most general histories, is a welcome addition to this one. This discussion is enlivened by the integration of social history and aesthetics. The book's final chapters discuss issues such as the impact of television on stage magic, and the importance, or lack thereof, of magic secrets. I especially appreciated their paragraph on the iconic (and rare) rabbit from a top hat trick in pop culture.

The best trick in the book is its interweaving of history with psychology. Previous historians citation of the Bible as a source justifies the current author's discussion of it, but their tone paradoxically combines empathy and scorn, such as "If we had lived [in the 17th century] we would have believed in God." The assessment of truth claims recurs throughout *The Secret History of Magic*, from the analysis of ancient texts to the English Royal Society's early struggle with epistemology and the complicated rise of the scientific study of the paranormal. Controversial anecdotes of magical feats are analyzed throughout the text, and the authors training and expertise qualifies them to assert that tricks that they "cannot

explain probably did not happen" (38).

While the authors' credentials are impeccable, and their scholarship up to date and deep, a few sources are strangely missing from their endnotes. The most serious of these is Michael Mangan's 2007 *Performing Dark Arts*, which examined ancient magical tales with the same analysis of "origin myth" as used in *Secret History* and then discussed persecution claims in greater detail and with a similar conclusion as Steinmeyer and Lamont. They also fail to cite Barbara Stafford's 1994 *Artful Science*, a book length discussion of 18th century entertainment (including magic tricks) as "rational recreation." Unfortunately, the book *Richard Potter: America's First Black Celebrity* (2018) was published too recently for its updated insights to have been included.

Steinmeyer and Lamont's book has a bias in favor of England, the U.S., and Europe respectively, but does discuss the relationship of western stage magicians to Asia. A few other decisions are more surprising. Given their opening discussion of ancient Egyptian myth, it is remarkable that they do not even mention the canard of a magic trick being depicted in an ancient Egyptian pyramid. For a book that in other places is a model of the critical analysis of a text, the author's uncritical reliance on the Blitz memoir is out of character. Since the authors do mention the rise in the U.S. of the magic correspondence course, I was surprised that they ignored the concurrent rise in the marketing of magic sets ("boxes of tricks" in England).

I could nitpick: with their remarkably lucid style, it is odd that the authors used the term "juggler" so often without explicitly stating that it used to mean "magician." The performer referred to in-text as "Ali Ben Bey" (217) is referred to as "Ben Ali Bey" in the source they cite. In chapter 10, the word "mindreading" should for clarity often be qualified as "theatrical mindreading." Several endnotes refer to "I" or "the author" without specifying which co-author is being referred to, and their chapter 4 note 35 source is not proportionate to the authors' claims.

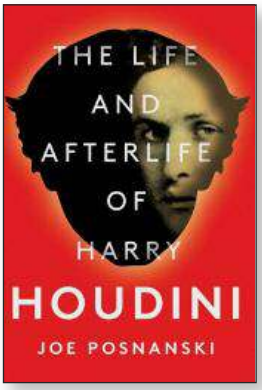
Secret History of Magic opens by asking about the meaning of performance magic for the history of civilization, and closes by asking what it means for individuals within modern society. For the discussion of cultural meanings, *Secret History* is more grounded in science and psychology (and better written) than is literary theorist Simon During's 2002 *Modern Enchantments*, or theater historian Michael Mangan's 2007 *Performing Dark Arts*. The intellectual breadth of *The Secret History of Magic* comes at the expense of ignoring many popular magicians. Thus it is more a complement than replacement to other general histories of entertainment magic, such as Milbourne Christopher's 1962 *Panorama of Magic* (revised and re-titled 1991 as *Magic: A Picture History*) or his somewhat mis-titled and much longer 1976 *The Illustrated History of Magic* (revised 1996 and 2006). A shorter and more recent option is the surprisingly good book by Joe Layden and Carl Waldman from 1997, *The Art of Magic*.

In conclusion, *The Secret History of Magic's* intelligence and synthesis of recent research makes it useful to experts in magic history, but its breadth and clarity make it an excellent introduction to the field. I highly recommend it. S

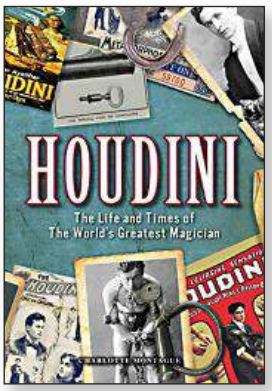
Houdini Lives

Reviews of *The Life and Afterlife of Harry Houdini* by Joe Posnanski; and *Houdini: The Life and Times of the World's Greatest Magician* by Charlotte Montague

REVIEWED BY MICHELLE AINSWORTH



Avid Reader Press, 2019. 318pp. $28.00; ISBN-13: 978-1501137235



Chartwell Books. 2017; 208pp. $14.99; ISBN-13: 978-0785835561

Almost a century after the last of his headlining vaudeville shows and traffic-stopping daredevil escapes, the name "Houdini" (1874-1926) remains synonymous with magic and escape. Early in the curious new book *The Life and Afterlife of Harry Houdini*, author Joe Posnanski spotlights the continuing torrent of Houdini marketing, Houdini TV shows, and Houdini books for young and old. The two books under review are worthwhile additions. The second, Charlotte Montague's recently reissued *Houdini: The Life and Times of the World's Greatest Magician*, evokes the entertainer's times more effectively than most previous biographies, while also being the most lavishly illustrated book about the Master Mystifier.

The Life and Afterlife of Harry Houdini is an overdue examination of the colorful showman's metaphorical afterlife; combining Houdini's story with a critique of earlier biographies, interwoven with thoughts about his life and legacy from recent Houdini fans, critics, and the author.

The main text of *The Life and Afterlife of Harry Houdini* is divided into nine unnumbered, named chapters with several named subsections in each chapter. There are a few black and white illustrations but no plates. There is a "Selected Bibliography" but no notes and no index. I realized how skilled a writer Posnanski is when I worried, about Houdini, whether he would die without becoming famous. Posnanski's narrative continues with most highlights of Houdini's career and stratospheric level of fame. For a book that is far more than a biography, it is remarkable that Posnanski includes one fact that does not appear in any of the major Houdini biographies: he reveals the name of the man who sold Houdini his first famous trick, the Metamorphosis trunk. Posnanski does not, however, highlight how special this is, nor cite his source.

Even when discussing Houdini's life, Posnanski plays less the role of biographer and more the journalist. For example, he doesn't simply say that Houdini's claim of a U.S. birth is false, he discusses other researchers' investigation of the question. With so much written about Houdini, Posnanski's integration of a critique of previous writers' work is a worthwhile idea, but he does so unevenly. Why did biographer William Lindsay Gresham get several pages while most more significant writers about Houdini get a few paragraphs or less?

An even greater contribution of *The Life and Afterlife of Harry Houdini* is its pioneering discussion of several people who currently live in the fandom that Posnanski dubs "Houdini World." From advance publicity I wondered whom he would discuss, but mistakenly took it for granted that one of them would be Arthur Moses. Moses is the premier collector of books about Houdini in all languages and editions, and author of *Houdini Periodical Bibliography* (which includes citations to Skeptic magazine), the first edition of which is listed in Posnanski's Selected Bibliography. Modern Houdini fans who are discussed by Posnanski are well chosen, and they share some good stories and shrewd comments.

Seventy something pages into the book, Posnanski quotes a discussion he had with Houdini blogger John Cox fretting about a discredited Houdini anecdote. Posnanski then cheekily includes the story, with variations. Later, he quotes a Houdini researcher as saying that his friend, who has also investigated Houdini lore, is wrong in his belief that Houdini's legendary Scotland Yard escape never happened. Though generally escaping the trap of exposing Houdini secrets, Posnanski does share several researcher's theories on the methodology of three key Houdini escape feats, and even offers his own ideas.

Most interview excerpts, however, are more stream of consciousness, such as narration about Houdini's father, leading to Posnanski's quotation of a living escape artist talking about her own father, or an incident of Houdini's cruelty toward a competitor segueing to a leading magic historian arguing that this was a key Houdini trait. This integration of biography and commentary can be helpful but also repetitive. For example, though all commenters agree that Houdini was blindingly brilliant as an escape artist, and most concede that he was a pioneering genius at self-promotion, these remarks, as well as the comments by several people that Houdini was not a very good magician are scattered throughout the book.

Most of the contemporary commentators are magicians, and Posnanski's project of showing Houdini's inspiring effect on modern magicians is laudable. But here too, his coverage is of varied relevance. I found it odd that Posnanski devoted more space to profiles of magicians specializing in card tricks than to the type of modern daredevil magician that Houdini is more often compared to, such as David Blaine. In two chapters on the extraordinary career of magician David Copperfield, Posnanski said nothing new about his massive Houdini archive. But Posnanski does characteristically make transparent his own process of research and excitement at meeting Mr. Copperfield.

The treatment of Houdini's critical relationship to spiritualist séances (in which people would gather in an attempt to communicate with the dead) is characteristically uneven. I applaud Posnanski for mentioning 19th century spiritualism's origin and dual influence on Houdini's early career. Later, Posnanski abruptly explains how a séance shattered Houdini's friendship with Sir Arthur Conan Doyle, the creator of Sherlock Holmes and an ardent spiritualist, though this is all he says on that much written about relationship. I was even more surprised that Posnanski somehow acknowledges that Houdini investigated the medium known as "Margery" without mentioning that he did so as part of a group of scientists for *The Scientific American* [see David Jaher's *The Witch of Lime Street*, reviewed in Skeptic v21 n3, 2016]. In the final chapter Posnanski follows recent research to the conclusion that a headline-making claim of Houdini's widow being contacted by his spirit was probably a publicity stunt.

Unfortunately, Posnanski refuses to discuss Houdini's extensive on and offstage spiritualist exposés, or even mention his headline grabbing testimony before the U.S. House of Representatives. This omission is remarkable given Posnanski's admission that Houdini's spiritualist activism increased his fame, since Houdini's fame is, after all, a theme of the book. It is similarly odd that Houdini's syndicated newspaper column (which continued after his death) is ignored, while a justly little-known short story by Houdini is tediously summarized and analyzed. Houdini's film career brought him a new level of fame as well, but it is given only a page (with a longer discussion of the recent rediscovery of a Houdini film that some feared had been lost). The coverage of his more recent fame is also uneven. For example, Posnanski talks about two Houdini museums, but ignores the many temporary Houdini exhibits that have recently toured in general interest museums.

My deepest concern with *The Life and Afterlife of Harry Houdini* is that, in

some cases, it is unclear whether quotations are from interviews conducted for this book or if the words are from previously published sources. Because the narrative alternates between Houdini's lifetime and the present (and even occasionally breaks chronology within Houdini's own time), the lack of an index is especially unfortunate. Integrating the biography of someone long dead with modern assessments and one's own research process is an interesting idea. Posnanski is a skilled enough writer that the result is engaging and highly readable, but the book sometimes feels like a rough draft rather than a polished narrative.

To Posnanski's credit, I found only two unambiguous factual errors: the subtitle of the significant Houdini biography by William Kalush and Larry Sloman is given as if it were the title (though it is correctly listed in the Selected Bibliography), and superstar magician David Copperfield never sang in any of his television specials. Of course the line between error and understandable oversight or interpretation can be fuzzy, and Houdini experts will debate some of Posnanski's assessments. For example, Houdini's psyche has been the focus of entire books, but that doesn't stop Posnanski from offering his own ideas.

The only other book I'm aware of to feature criticism of Houdini so prominently is *The Houdini Code Mystery* (2000) by Canon Rev. William V. Rauscher, though there is little duplication since most of the critics quoted at length by Rauscher were Houdini's contemporaries. Additionally, Rauscher's discussion of Houdini and séance fraud is not limited to the post-mortem séance from which the book gets its title. Three books on Houdini and spiritualism that are more widely available are Houdini's own *A Magician Among the Spirits* (1924, with many reprints), *Houdini Speaks Out: I am Houdini and You are a Fraud!* by Arthur Moses (2007, revised 2014), and the more credulous *The Magician and the Spirits* by Deborah Noyes (2017). Houdini's films are analyzed in the most detail in *Disappearing Tricks: Silent Film, Houdini, and the New Magic of the Twentieth Century* (2010) by cinema scholar Matthew Solomon.

Some readers will get more out of *The Life and Afterlife of Harry Houdini* if they read a general Houdini biography first, while others may be inspired to do so afterwards. The most well documented general Houdini biography is the thorough but out of print book *Houdini!!!....* (and its limited-edition companion volume *Notes to Houdini!!!)*, both by the late Pulitzer Prize winning biographer Kenneth Silverman (1996) [both reviewed in Skeptic v6 n1 1998].

* * *

A more readily available alternative is the contextually rich, illustrated biography *Houdini: The Life and Times of the World's Greatest Magician* by Charlotte Montague (2017, re-released 2019). It includes an index and "Further Reading," but there are no notes. Montague ends the book with a two-chapter annotated list of Houdini inspired books (including Houdini's own, some major biographies, and many novels), films and TV shows about him, and even video games featuring Houdini. This is an excellent complement to Posnanski's book, and the most extensive recent list in popular book form. (The most thorough lists are on the well-organized website www.wildabouthoudini.com, maintained by blogger John Cox).

Montague opens the book with a helpful two-page overview of his life, then surveys all of the major Houdini life and career highlights missed by Posnanski, including more about Houdini's family, his aggressive presidency of the oldest lasting national magicians' organization, more detail on Houdini's pioneering airplane flight, secrets of many of his most famous tricks, a chapter on his friendship with Arthur Conan Doyle that is broader than Posnanski's, and narration of Houdini's jail escapes and other of the relentless publicity stunts and on stage feats that kept audience members buying tickets.

The sidebars that appear throughout the book are sometimes about people or topics that were tangential to Houdini's life, but they helped me understand Houdini in a different way than do the minutiae in more focused Houdini biographies. For example, the dozen pages devoted to Houdini's film career includes background on the history of film and a sidebar on how the work of one of his producers evolved into a major motion picture studio. From these I was better able to understand how Houdini's films went from being serials to features, and better appreciate his early use of a robot character. Montague persuasively analyzes Houdini's brief passion for film as a facet of his determination to stay on top of entertainment trends, and discusses how and why his film career briefly soared and then plummeted.

While not her focus, Montague's *Houdini* also has extensive coverage of his work on séance fraud. She mentions, for example, that he wrote about it as early as his 1906 book *The Right Way to Do Wrong*, which was published more than a decade before his more extensive and famous *Magician Among the Spirits* (1924). She even notes that he died before he could publish his intended follow-up, *The Cancer of Superstition*. Montague includes informative sidebars on many mediums and psychic investigators, including Harry Price (with whom Houdini corresponded extensively), Houdini friend Joseph Rinn (see also eSkeptic, January 30th 2013), and medium Eusapia Palladino. Montague's tone is skeptical, as the chapter on the medium "Margery", titled, "How Did She Do It?," suggests in part that she sometimes used her foot to make the séance table move.

Houdini: The Life and Times of the World's Greatest Magician by Charlotte Montague is a good general biography. Although Houdini blogger John Cox rightly points out that Montague's biography includes errors, such as the story of Houdini magically ringing the bells of the Kremlin (which Posnanski debunks), it is on par with most other biographies in terms of reliability. Montague's book is reasonably up to date, too, with, for example, an illustration of a Houdini spiritualism lecture poster that was rediscovered relatively recently. Having illustrations on almost every page illuminates his life and evokes his showmanship, as well as making the book easy to dip into. Its coverage of the rich social context of Houdini's era exceeds that in wordier biographies. S

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Junior Skeptic

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Junior Skeptic

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This Issue's Cover features artwork by Daniel Loxton.

ARE YOU EATING FAKE FOOD?

HELLO!

Everybody eats food. Along with air, water, and shelter, food is a basic human need. Food is the most important thing we buy, and we can't choose not to. We can't survive without food!

Almost no one in our culture is able to grow or forage for all of their own food. Even people who live on farms still buy ingredients for cooking and baking. Foods such as flour, sugar, and cheese need to be processed. Other foods come from far away places, such as tropical fruit, seafood, salt, spices, coffee, or tea. That means we have to rely on products sold in stores. But what happens when people sell food that isn't what it's supposed to be?

Let's find out!

THE NATURE OF FRAUD

It's a huge job to feed everyone in a society. The food supply in any large modern country is almost unimaginably complicated. It's unfortunate but true that things sometimes go wrong in any complicated system.

It can be dangerous when accidents happen in the food supply. Modern countries have ways to fix food mistakes, such as removing meat from stores when tests show it could make people sick. Food safety is an important topic, but we aren't going to talk much about mistakes today. Our topic is deliberate "food fraud."

"Fraud" is when somebody uses a dirty trick to get something (usually money) from someone else. We have a lot of words for this kind of trickery—"scam," "swindle," "rip off" and so on—because fraud happens a lot. It's as old as civilization. As long as greed and dishonesty exist, there will always be schemes to cheat people out of money.

For example, some dishonest sellers try to get away with giving customers less than the promised amount of something. This kind of fraud is risky. If someone checks the count or measurement, the cheater might get caught.

It's safer for scammers to use tricks that are harder to detect. One is to take something cheap and disguise it as something expensive. There's little risk if customers can't tell the difference. For example, scammers might sell fake "antiques" that look old but are actually brand new. There are sneaky fake versions of practically every kind of product. Sadly for our supper, that definitely includes food!

Junior Skeptic

AN ANCIENT PROBLEM

Food is one of the largest industries in the world. There are well over seven billion people on Earth, and we all have to eat. Every day, fleets of trucks, trains, jets, and ships carry mountains of food from one side of the planet to the other. The global food industry is worth countless billions of dollars every year. It is so vast that no one can keep track of every part of it.

That's a recipe for fraud! Wherever products are bought and sold, some people will try to profit from cheating. In an industry as complicated as food, it's all too easy to cheat and get away with it.

The Global Problem of Food Fraud

"Food fraud" is when a seller dishonestly tampers with food itself, food measurements, or food labels to make food appear more valuable than it really is. Some sellers cheat the measurements of the food they sell, such as by injecting water into meat to make it plumper and heavier. Others secretly blend cheaper ingredients into valuable foods. Cheaper sugar syrup is sometimes mixed into supposedly pure honey, for example. Some scammers sell food with fake or misleading labels. Or, they may sell outright fake foods—cheap imitations disguised as the real thing. In some cases, fake food isn't edible. Food fraud can even prove deadly.

Some food trickery is legal; other scams are definitely crimes. Either way, the disturbing truth is that quite a bit of the food sold in stores and restaurants today is deceptive in some way. Almost everyone alive has been fooled about food. This was not always the case.

The Invention of Fraud

Tens of thousands of years ago, everyone knew exactly what they were eating. That's because they hunted and foraged for their own food. If they dug up roots, well, those were definitely roots. If they killed a mammoth, they knew they were eating mammoth.

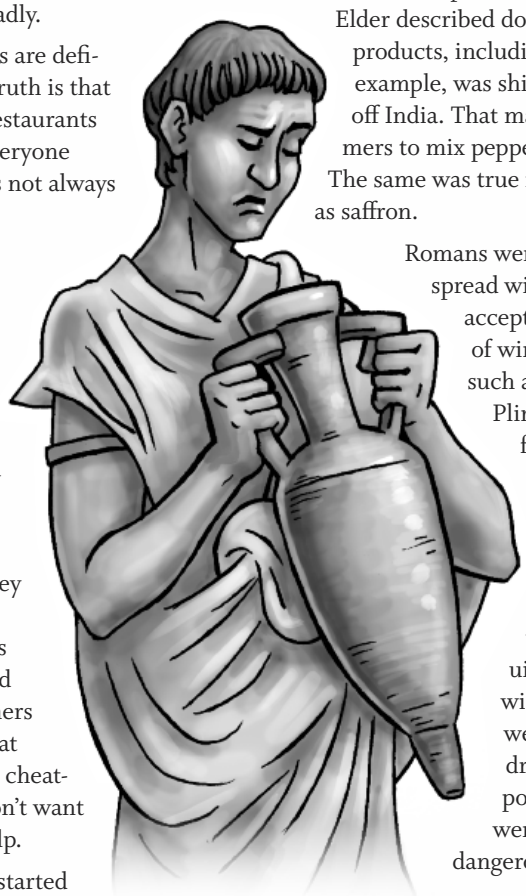
Later, when ancient people began to grow crops and raise animals on farms, they still produced and prepared most of their own food. Even with local trade, there was little chance of fakery. If one farmer traded some grain for a neighbor's goat, both famers could see if the grain was good and the goat was healthy. Besides, people tend to avoid cheating in small communities because they don't want to anger the neighbors they rely on for help.

All that changed as soon as merchants started to buy foods in one place and then sell those foods to strangers in another place. It's the business of merchants to buy for as little as possible, then sell for as much as they can. The difference is where they make their profits. Unfortunately, misleading customers is one way to increase those profits. For countless centuries, dishonest merchants have tricked customers into paying more than they should for goods of all kinds. Around 3,800 years ago, for example, one Babylonian merchant took an order for 1080 pounds of top quality copper ingots. Then he tried to pass off lower quality copper to his customer instead. However, the customer was not fooled. He wrote an angry letter on a clay tablet, demanding a refund from the cheating merchant.

Ancient Food Fraud

Ancient people obviously had some ability to detect shoddy copper. However, it was often impossible to detect food fakery. Customers had only their own senses to check the quality of food. If a scammer could fool a customer's eyes, nose, and taste buds, the customer would fall for anything.

The Greeks and Romans were all too familiar with the problem of food fraud. They knew that foods were routinely "adulterated," or deceptively mixed with lower quality ingredients. So were other luxury products such as ointments, medicines, and perfumes. The Roman writer Pliny the Elder described dozens of commonly adulterated products, including honey and spices. Pepper, for example, was shipped at great expense from far off India. That made it very profitable for scammers to mix pepper with cheaper substances. The same was true for other expensive spices such as saffron.



Romans were especially irritated by widespread wine scams. It ancient times it was acceptable to alter the flavor or color of wines using harmless substances such as honey or raisins. However, Pliny was horrified that the wine faking industry often used poisonous ingredients and "noxious drugs" to alter wine to "suit our tastes." Wine fakery was so common, Pliny complained, that even the wealthiest customers were unable to buy genuine wines. He marvelled that the wines with the best reputations were actually the least safe to drink. This was because the most popular and expensive wines were most often faked—often with dangerous ingredients.

MEDIEVAL FOOD SWINDLING

The Romans knew they were plagued by food fraud. However, adulteration was an even bigger problem than they realized. It turns out that many Romans personally added even more poison to the wine they drank. In those days, people used toxic lead as a sweetener! Lead is deadly. Unfortunately, it is also very tasty. It would be many centuries before people learned that lead is a slow, sweet poison—and even then, ruthless food fraudsters continued to put lead into food.

Food fraud continued long after the Roman Empire broke apart. No one was safe from food swindles during the medieval period of knights and castles. In fact, food fraud was one problem that concerned the rich at least as much as the poor. Peasants mostly grew or hunted for their own food. Rich merchants and nobles could afford the spices and other luxury foods that were the most profitable for swindlers to fake.

Medieval Food Laws

Naturally, authorities tried to do something. Cities and kingdoms passed laws against food fraud. Cheaters were punished.

By 1066, for example, the English town of Chester had outlawed adulterated beer. Guilty brewers were fined or sentenced to sit in the unpleasant sounding "dung stool." Around 200 years later, the king of England banned numerous kinds of food fraud—especially fraud by cheating bread makers. Townsfolk across the kingdom relied upon the calories in bread to survive. The king decreed that all bread must be sold at certain prices and weights based on the price of grain. Bakers who cheated their customers could be fined. If their "offense be grievous and often," they could be sentenced to stand in a "pillory." This was a wooden restraining device with holes for a prisoner's head and hands. Prisoners were displayed in the public square, where they were shamed and often abused by angry townspeople throwing filth or rotten food.

The English king outlawed food measurement scams. He also banned the sale of "corrupted wine" and meat from diseased animals. In fact, the law made it a crime for anyone to sell *any* food or drink that was "not wholesome for man's body, or after…they have kept it so long that it loses its natural wholesomeness."

Many other countries passed similar laws to combat food fraud. Unfortunately, these laws were often broken. For every scammer who was caught and punished, there were many others who got away with it. Food was inspected too rarely, and the punishments were usually mild. Why would a baker care about a small fine if they could earn a larger amount by cheating?

Trade Guilds Enforce Standards

Trade guilds also helped to reduce food fraud. During the medieval period, craftspeople and merchants found it useful for business to create associations to govern their particular kind of trade (such as weaving, knife making, or spice selling). Trade guilds trained their members, set standards for quality, and sometimes punished members who cheated. After all, a cheating guild member could damage the whole guild's reputation and cost everyone money.

Also, some guilds were granted special powers and responsibilities by the king. In England, for example, the pepperer's guild was given the important but funny sounding job of "garbling." This came from an Arabic term meaning "sifting" or "selecting." Pepper was very frequently adulterated in medieval times, just as it was in the Roman Empire. Garblers fought this fraud by inspecting spice shipments to make sure that they were pure.

This worked fairly well for several centuries. The pepperers guild made it harder to fake luxury foods. This was so useful that the guild's responsibilities grew. It eventually became a new organization called the Grocer's Company. The king put the grocers in charge of inspecting food in general.

This did reduce fraud, but it came at a cost. The grocers charged as much money as they could for all those food inspections. Also, they didn't exactly work for the public. Putting the food industry in charge of food inspection was a bit like asking the fox to guard the hen house. There were many complaints that the inspectors were crooked.

Also, the world was changing. The small kingdom of England was growing to become the vast British Empire. It held rich territories all around the world. Fleets of sailing ships carried goods back and forth from those territories, making powerful new mega-businesses immensely wealthy. Those mega-businesses complained to the government that a medieval system of food inspection was no longer useful or necessary. They argued that inspections increased costs and hampered trade. Government leaders worried that they were right. Trade was making the British Empire into the world's most powerful nation. Leaders reasoned that it would be better for everybody if government got out of the way of business. Old food laws were canceled, ignored, or forgotten. The grocers lost their power to inspect food.

So, who *was* responsible for preventing food fraud? For the most part, no one! What could possibly go wrong?

Most kinds of food fraud were perfectly legal in England during the early 1800s. Very few food swindles were banned, and those laws were rarely enforced. For example, it was technically illegal to adulterate coffee, but *most* coffee was heavily blended with cheaper chicory (a roasted root). Government officials said it wasn't worth the trouble to enforce that old law. Coffee fraud was too hard to prove. They argued that it was best to ignore food fraud unless it cheated the government out of tax money.

This added up to one of the biggest and boldest social experiments of all time. What happens when there are so few rules that sellers can do just about anything they want to the food supply? England was about to find out.

Life During the Industrial Revolution

A lot of things seemed to be going great when 1820 rolled around. England was glowing with wealth and power. Advances in science and technology had brought about an "Industrial Revolution" that transformed society. Machines powered by waterwheels or steam could make cloth and other goods faster and cheaper than ever before. Thousands of new factories made England an economic powerhouse. Canals, steam ships, and railways made transportation faster. English scientists constantly announced amazing discoveries, such as the fossilized remains of giant reptiles. (See Junior Skeptic #73.) It was a glorious time to be alive—if you were rich.

However, life was absolutely awful for the working poor. Working conditions were harsh, filthy, and unsafe. Adults and even small children toiled day and night in factories and mines. They were paid barely enough to survive. If they quit or got fired, they might literally starve.

Worse, workers were powerless to change things. They weren't allowed to vote in elections. Instead, rich landowners elected other rich people who passed laws that benefited the rich. They made it a crime for workers to form unions, go on strike, or join together to negotiate for better wages or working conditions. Workers could go to jail just for attending a meeting to talk about the problems. Larger protests were violently crushed by police or the army.

This trapped millions in misery. Let's not dwell on the poverty they endured, the slums they lived in, the choking coal smoke, the backbreaking labor, or the constant threat of hunger, crime, and disease. Instead, let's imagine, just for a moment, some lighter moments of nourishment or pleasure. Imagine a mother as she buys milk for her baby, or splurges on some mustard to liven her family's meager supper. An exhausted steelworker stops for a pint of beer after his 14-hour shift. A woman drinks tea or coffee to stay alert around dangerous factory machines. A young boy savors a rare treat of candy on the way down to work in a candlelit coal mine.

The grim reality was that almost all of those people would have been cheated when they bought their food and drink. Some may also have been poisoned.

Exposing the Corrupt Food System

The food supply in English cities had become so thoroughly corrupted with fraud that it was nearly impossible to buy food that *wasn't* adulterated. Practically everyone got ripped off every day. People on the edge of hunger were routinely robbed of the nourishment they needed to survive. Food fraud sickened many people, and killed others.

The food swindling plague had been festering in the shadows for decades, secretly spreading to every store and dinner table. Few people realized how bad things had gotten—until one scientist decided to find out for himself.

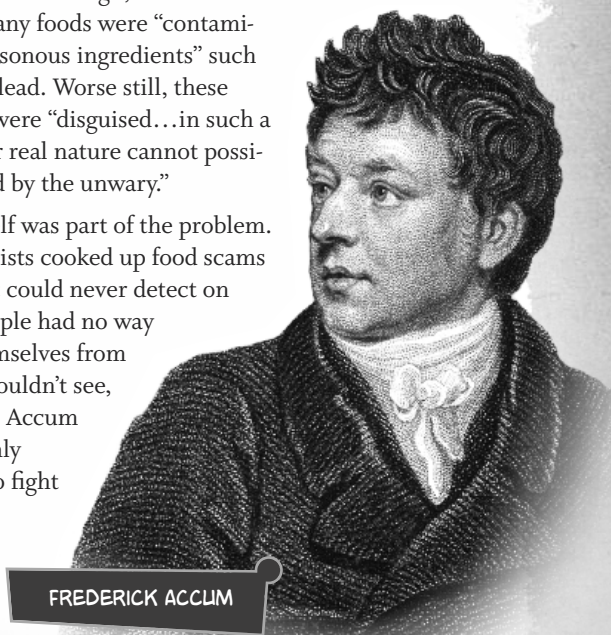
Frederick Accum was a well-known chemist, and bit of a "foodie." He loved wholesome cooking so much that he developed chemistry tests to detect common kinds of food adulteration. He tested countless food samples from all around London.

The results filled him with "regret and disgust." Foods were so often faked that "it would be difficult to mention a single article of food which is not to be met with in an adulterated state; and there are some substances which are scarcely ever to be procured genuine."

He decided to expose the whole rotten mess. His 1820 book *A Treatise on Adulteration of Food and Culinary Poisons* was the first major scientific study of food fraud.

Accum revealed that countless foods were "very generally" fraudulent, including "tea, coffee, bread, beer, wine, spirituous liquors, salad oil, pepper, vinegar, mustard, cream" as well as candy, milk, pickles, lemonade, and catsup. If that was not bad enough, Accum's tests also proved that many foods were "contaminated with poisonous ingredients" such as copper and lead. Worse still, these deadly toxins were "disguised…in such a form that their real nature cannot possibly be detected by the unwary."

Science itself was part of the problem. Crooked chemists cooked up food scams that the public could never detect on their own. People had no way to protect themselves from poisons they couldn't see, smell, or taste. Accum thought the only solution was to fight science with science.



FREDERICK ACCUM

Image: Wellcome Collection

Accum was a popular science celebrity, and the results of his food fraud research were shocking. His book caused a public uproar. The sheer size of the problem was staggering. "The eager and insatiable thirst for gain" had led to food fraud *on an industrial scale across the whole of society*.

Take bread, for a relatively harmless example. Almost all of the bread eaten by working class people contained "alum," an aluminum salt that bakers used to bleach low quality flour. This may have caused health problems for some people, but it was nowhere close to the most dangerous thing in the food supply. Accum felt that the alum issue was "comparatively unimportant." However, almost *all* bakers *secretly* used alum to make cheap bread look like expensive bread. This hoodwinked customers.

And yet, bakers had little choice. They were forced to cheat because everyone else did. Honest bread either looked worse or cost more. In either case, customers would buy from the dishonest bakery next door.

Some counterfeit food frauds cheated people out of money without harming them physically. For example, coffee was almost always blended with a large amount of cheaper chicory or burnt peas or beans. Indeed, some scammers sold "coffee" that contained "not a particle of genuine coffee." Accum examined pepper samples that were heavily blended with other plant ingredients and clay. Vinegar and lemonade were imitated using cheaper kinds of acid. "Genuine mustard," Accum found, "is perhaps rarely to be met with in the shops." Mustard samples were typically stuffed with cheaper food ingredients such as flour, radish, and turmeric. "Cream is often adulterated with rice powder," and a "liberal quantity of water is often added to the London milk," Accum explained.

These fraudulent ingredients were at least edible, for the most part. But they weren't harmless. The ugly truth was that thousands of crooks were systematically stealing from people who struggled to afford food. This was deeply unfair. It also endangered the poorest, most vulnerable people in society, such as underfed children in orphanages.

Deadly Swindles

Accum saved his greatest anger for scammers who put lives at risk. One "disgusting… abominable" but common practice was to inflate meat and fish using "breath respired from the lungs" of the seller. This widely used "dirty trick" contaminated the meat supply with contagious diseases.

Other scammers poisoned food with deadly toxins. Poisonous laurel leaves were used to flavor custards, wines, and fake tea. Another poisonous plant was used to make watered down beer more intoxicating. That single scam was a large industry in itself, involving countless importers, drug sellers, brewers, and pub owners.

But the gravest danger was heavy metal poisoning. Accum's tests revealed dangerous levels of copper and lead in countless fraudulent foods. Fake tea made from ordinary shrubs was colored with copper. Copper was also used to make pickles look greener. Scammers used lead to color many foods, including wine, liquor, cayenne pepper, and anchovies. Most shockingly, *both* copper and lead were regularly used in *candy for children!*

Accum's readers were furious to learn that the "possible sacrifice of a fellow-creature's life, is a secondary consideration among unprincipled dealers." This truth was also terrifying. Accum's tests could detect which foods were poisonous, but most people weren't chemists. As long as the authorities did nothing, helpless consumers were left at the mercy of criminals. Accum marveled,

> *It is really astonishing that the penal law is not more effectually enforced against practices so inimical to the public welfare. The man who robs a fellow subject of a few shillings on the highway is sentenced to death, while he who distributes a slow poison to a whole community escapes unpunished.*

The whole situation was completely bonkers. And yet, it wouldn't get better for decades. Despite Accum's evidence, the laws were not changed. Accum soon left England after an unrelated scandal. (He tore pages out of library books.)

Looking Closely

Crooks went right on selling the same fake and dangerous food for 30 long years after Accum's book. No one stopped them. People became so distrustful of grocers and bakers that they fell for exaggerated rumors. Some people worried that bread contained ground up human bones. This wasn't true, but if no one was checking, how could anyone be sure?

Then, in 1850, another scientist finally took up the food crusade. Arthur Hill Hassall was a young doctor who became curious about the genuineness of the coffee sold in London. As we've seen, coffee was usually adulterated, but this was surprisingly difficult to prove. It was easy to detect lead using the chemistry of the time, but harder to tell the difference between two organic materials such as coffee and chicory. However, Hassall thought he could look at this problem

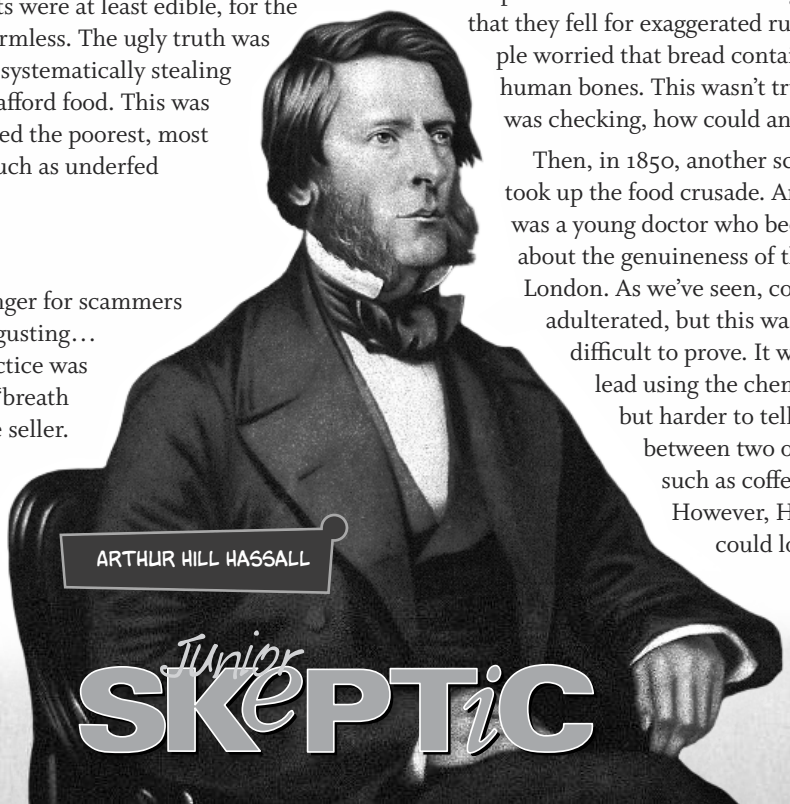


Image: Wellcome Collection

in a brand new way: through the lens of a microscope!

It turned out he was right. When examined under a microscope, coffee looks nothing like chicory. Other fake ingredients were just as easy to identify. Hassall could not only tell whether a coffee sample was adulterated, but also how much, and with what. Between chemistry and the microscope, science could now detect most kinds of food fraud and determine exactly how common they were. It was just a matter of looking.

Hassall began by testing 34 different brands of coffee. Only *three* of these were genuine! Many samples were *mostly* chicory; some contained no coffee at all. Further tests found that 85 percent of 179 coffee samples were fraudulent. Most of London's coffee was fake!

Hassall presented his coffee findings to the Botanical Society. When newspapers reported his scandalous discovery, another doctor named Thomas Wakley rushed to contact Hassall. Wakley was the editor of a medical journal called the *Lancet*. He also knew the dangers of food fraud all too well. Wakley had recently been the coroner in a horrifying case where many orphans died. The orphans were malnourished with oatmeal adulterated with cheaper and less nutritious barley meal. This made them vulnerable to a deadly disease.

Wakley presented Hassall with a stunningly daring plan. He wanted Hassall to keep testing London's food, then publish the results in a series of *Lancet* articles—along with the *names and addresses of the people who sold the food they tested*. This would reward honest food sellers while publically shaming swindlers.

Hassall was amazed by the "great moral courage" of this almost crazy plan. Public accusations would make crooked food sellers *furious!* Hassall and Wakley might be ruined by lawsuits (or worse).

But they did it anyway. The *Lancet* published Hassall's food test findings for five years. They were relentless, calling out *hundreds* of sellers by name. To pick an example at random, one "S. Berry, 21 Great Windmill-street, Haymarket" sold candy contaminated with "chromate of lead in poisonous quantity." Take that, S. Berry! We can only imagine what his customers had to say.

Bad News Everywhere

Hassall's research confirmed that the food supply was every bit as corrupt as Accum had warned 30 years earlier.

For example, Hassall discovered that genuine mustard was "scarely ever to be obtained" at any price. *Every single one* of 42 mustard samples was adulterated. Certain types of tea were "invariably adulterated," often with poisonous substances. About half of milk samples were watered down, sometimes by 50 percent—and the water was filthy. (Every one of the nine London water companies sold badly contaminated water. Most was pumped straight out of the famously polluted River Thames.)

Food was often robbed of basic nutrition. More than half of Hassall's oatmeal samples were heavily adulterated with inferior barley meal. This kind of fraud hurt the very poorest people, as Wakley had seen. Hassall specifically tested the food sold to workhouses, hospitals, prisons, and charitable institutions. He found that food for the poor was "extensively and systematically adulterated…to a fearful extent."

Hassall's tests also confirmed Accum's warnings about poisonous food. Every pickle sample contained toxic copper; one in five contained "highly deleterious" or "poisonous amounts." Cayenne pepper was adulterated in 24 out of 28 samples; roughly half contained lead, "often in large and poisonous quantities." Nearly four-fifths of 26 curry powder samples were adulterated; eight of these contained lead. Copper was found in 33 out 35 samples of jam, sometimes in "very large amount." Candy was frequently poisonous, with *60 percent* of red-colored candies containing lead or mercury.

Something Had to Be Done

After 2,500 food tests and years of publicity, Hassall and Wakley's campaign finally got some results. The government formed a committee to look into food fraud. Hassall testified and showed samples of poisonous candy.

The evidence was clear. The food system was badly broken; it had been for decades. Nevertheless, some people were firmly opposed to fixing it. The committee asked one witness, "Is there not an understanding between the public and the seller that the seller shall give to you what you ask for?" The witness replied, "I think not; neither do I think it beneficial that it should be so."

Despite such attitudes, the tide was slowly turning. Then, in 1858, poisonous mints suddenly sickened 200 people—and killed 20 of them. The candymakers intended to adulterate the candies with plaster. They accidentally used deadly arsenic instead! At long last the government agreed that something had to be done.

The Adulteration of Food and Drink Act was passed in 1860. Stronger versions of the law followed in 1872 and 1875. These laws made it illegal to sell harmful food, secretly adulterate food with cheaper ingredients, artificially increase the size or weight of food, or lie about food in labels or advertisements. Lawbreakers could be punished with large fines or even prison time. Most important, the new laws ordered the hiring of food inspectors. From now on, someone would check that food was genuine and safe.

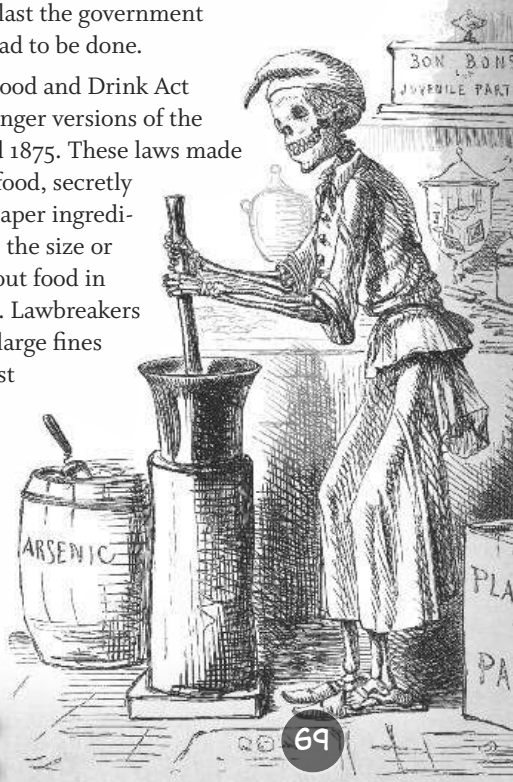


Image: Wellcome Collection

It took time, but England's new food inspection system worked. Previously common food swindles became rare. Most food could be trusted most of the time.

North Americans weren't so fortunate. Both Canada and the United States struggled with their own food fraud epidemics. Canada soon followed England's example, passing food laws and enforcing the laws with food inspections. Tests in 1877 showed that there was a lot of work needed to clean up Canada's food supply. For example, almost all samples of coffee, mustard, ginger, and pepper were heavily adulterated with cheaper substances.

While other countries worked to control food fraud, the United States allowed fraud to worsen and spread. Unfortunately, American citizens paid a steep price. In the decades after the Civil War, America's food supply became just as corrupt and unsafe as England's had been, and in the same ways. Adulterated pepper, coffee, bread, beer, honey, milk—all the old swindles thrived in the U.S.A.

Nation of Fraud

"The theory of our government leaves people to take care of themselves as much as possible," explained entertainment promoter P. T. Barnum. His 1865 book *Humbugs of the World* took a hard skeptical look at American food fraud. Barnum was especially appalled by fake booze. "Adulterating and imitating liquors is a very large business," he explained. "There is very little pure liquor, either malt or spirituous, to be obtained in any way." Liquor was faked for the same reasons as other commonly adulterated foods. The genuine article was expensive, imitations were cheap, and *customers could not tell the difference*. Whenever those things were true, Barnum knew, "somebody will make and sell that imitation."

Another problem with alcohol products, Barnum explained, is that they passed through a lot of hands. Brandy might be made in Europe, imported to New York by one dealer, sold to another dealer in Buffalo, then to another dealer in Chicago, then to an inn that sold it to customers. The brandy might be diluted with cheaper substances at any step along that chain, or even diluted several times at several steps. Worse, the fraudulent ingredients were sometimes "villainous drugs and deadly poisons." Barnum concluded that the "annual loss of strength, health, and life caused by the adulteration of liquor is truly appalling."

Tainted liquor was highly dangerous, but America's deadliest food fraud was probably milk. Newspapers repeatedly exposed the scandal of "swill milk." Big cities like New York couldn't bring in enough fresh milk from farms in the countryside. Instead, thousands of cows were packed into filthy overcrowded barns behind beer breweries. The cows were poorly fed on leftover "swill" grain from the brewing process. This made them weak and unhealthy. They produced watery, low quality milk that smelled of alcohol. This was further watered down with dirty water. Other ingredients were then added to disguise this concoction as normal, nutritious milk from farms. Sadly, swill milk was extremely dangerous for babies to drink.

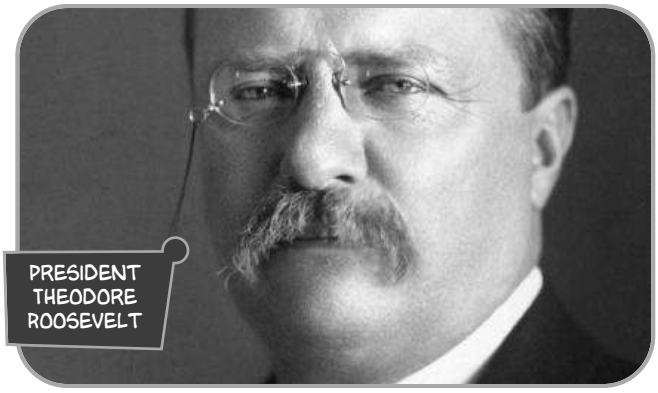
The Long Fight for Change

Swindling continued for decades while the federal government did nothing. Then, in 1883, a scientist named Harvey Washington Wiley became the head chemist for the U.S. Department of Agriculture. Wiley thought adulteration was a "disgraceful evil." His department issued detailed reports about the fraud problems with dairy products, spices, coffee, and other foods. For example, Wiley testified to Congress that "more than half" of honey was heavily adulterated with cheaper sugar syrup. Wiley even conducted experiments in which healthy volunteers became sick after eating large doses of preservatives. He campaigned for years for tough new food laws. The government still refused to act.

Then a work of fiction unexpectedly shocked the country into action. Novelist Upton Sinclair worked undercover for weeks in a meatpacking plant, then described what he saw in his 1905 book *The Jungle*. The details were stomach-churning: filthy factories crawling with germs and rats, sausages made from rotten meat, and so on. Disgusting!

When President Theodore Roosevelt read the novel, he immediately wrote to ask Sinclair if these details were true. Roosevelt vowed that the "evils you point out shall, if their existence be proved, and if I have power, be eradicated." He met with Sinclair, then sent investigators to check the book's gruesome claims. Roosevelt found Sinclair irritating, but refused to "disregard ugly things that had been found out simply because I did not like the man who had helped in finding them out." Sure enough, the President's investigators confirmed almost everything Sinclair said.

Roosevelt was fed up. It was time to clean up America's food supply! He pressured Congress to pass food laws. In 1906, Congress passed the Pure Food and Drug Act and the Meat Inspection Act. The United States finally had laws to fight food fraud and make food safe for the American people.



Problem solved? Well, yes and no. The meat industry hurried to clean up its act. Food fraud was severely reduced. Today, hundreds of millions of Americans eat safe, clean food every day—and they usually get what they pay for. However, food fraud was never completely eliminated. Even now, food fakery remains surprisingly common. How can that be?

Limits of Food Regulation

Food laws are never perfect, and even the best laws have down sides. Bold and clever crooks still find ways to cheat.

Some laws are just too weak. If food is rarely inspected, or if punishments are small or rarely enforced, it just doesn't matter what the laws say. Swindlers will ignore the rules.

On the other hand, inspections and law enforcement cost money. In the end, those costs are always paid by customers or taxpayers. It would be far too expensive for any society to test *all* of the food on the market. Government food agencies must make decisions about which foods to inspect and how often. Naturally, they pay more attention to deadly risks like accidental contamination of meat with bacteria. Simple cheating is a lower priority. Foods that are inspected less often are more likely to be faked, even today.

Also, some food fraud is really hard to detect. Accum knew 200 years ago that food fraud is a scientific arms race. Dishonest food scientists constantly invent sophisticated new ways to fool people; honest scientists constantly invent new techniques to detect fraud. Unfortunately, food fakery is a huge global industry with billions of dollars to spend. Catching that fakery often takes expensive and difficult scientific research.

READ LABELS CAREFULLY! THIS CANADIAN PRODUCT LOOKS LIKE 100% BLUEBERRY JUICE, BUT THE FINE PRINT SAYS "BLEND OF FRUIT JUICES." THE MAIN INGREDIENTS ARE ACTUALLY "APPLE AND/OR PEAR" JUICE AND *THEN* BLUEBERRY JUICE FOR FLAVOR.

Food Laws Can Make Some Things Worse

Strangely enough, food laws can themselves mislead customers. First, the existence of laws may fool people into thinking food fraud no longer happens. People are much easier to swindle when they aren't paying attention.

Also, food laws are usually a compromise between lawmakers and the food industry. This makes sense. As England's food adulteration committee reported in 1856, "The great difficulty of legislating on this subject lies in putting an end to the liberty of fraud without affecting the freedom of commerce." It's good to protect the public from scams. At the same time, sensible food laws should allow businesses to make money producing safe, tasty, nutritious foods that the public can actually afford. That means listening to the concerns of food producers too.

But compromise laws can sometimes mislead people. In 2016, for example, the Coca-Cola company won a long court battle defending the name of its Minute Maid brand Pomegranate Blueberry 100% Fruit Juice Blend. The company was sued because the product (not shown) actually contained *less than one percent* pomegranate juice! It was almost entirely apple and grape juice with a misleading name and label. Even U.S. Supreme Court Justice Anthony Kennedy was fooled, saying "I thought that this was pomegranate juice." But Coca-Cola won the case because the label did comply with U.S. Food and Drug Adminstration (FDA) rules at the time. (After "Pomegranate Blueberry…" the label continued "…flavored blend of five juices" in smaller letters.)

Laws also require definitions. Consider this: what is a "lobster"? Most people would think of the familiar Maine lobster with big claws. But what about other similar species? The FDA allows two species to be called "lobster," and numerous others to be called "spiny lobster" or "slipper lobster." In 2005, the FDA agreed with the food industry's requests to call some much cheaper species of smaller animals "Langostino lobster." Restaurant chains then deceptively shortened that name to "lobster," even though langostinos are not part of the lobster family at all!

Other claims surprisingly have no legal definition. "Natural" food claims have been popular for half a century. Grocery shoppers may assume that food products "couldn't say that if it weren't true," but the FDA never got around to defining the term "natural." When used in most food claims and names, "natural" means whatever a food company wants it to mean—which is to say, anything or nothing. It's just something that sounds good, like "Zany!" or "Fantastic!"

Sometimes the food industry even uses anti-fraud arguments as an excuse to convince lawmakers to pass unfair laws against competitors. For example, the butter industry convinced some U.S. states that yellow margarine was basically just fraudulent fake butter. For decades, it was illegal to sell yellow-colored margarine in those states. (Yellow margarine remained illegal in Quebec, Canada until 2008.)

FOOD FRAUD TODAY

Despite laws, customers are often still cheated at restaurants and grocery stores. Let's uncover some deceptive practices in the modern food industry, beginning with the merely shady and working up to the outright criminal.

Lying by Telling the Truth

It's common for food packaging to mislead customers without actually lying. For example, cereal might say "MAPLE" or "VANILLA" in huge letters, then say "simulated flavor" in teensy tiny letters. Such labels are tricky, but customers won't be fooled if they read the box carefully. (Ingredients lists are usually accurate.)

Many products make claims that are completely true but also totally misleading. For example, bottled water may claim to be "gluten free" or "non-GMO." Those claims are true for *all* water, including your tap water at home. It's misleading for the same reason to label pork or chicken in the U.S. or Canada as "hormone free." *All* of our pork and chicken is hormone free by law.

Stretching the Truth

Recently at dinner I asked my kids to examine the label of our container of "100% Parmesan." The package boasts of a "taste that's 100% real, 100% parmesan." However, "parmesan cheese" is *not the only listed ingredient!* The product also contains cellulose powder (and a preservative). Cellulose is a common food additive made from plants such as corn cobs or wood. It freaks people out to hear there may be wood in their cheese, but cellulose is perfectly safe. (We can't digest cellulose, but it acts as dietary fiber. Cellulose occurs naturally in fruits and vegetables.) It's commonly added to grated parmesan products to prevent clumping. However, it's also common to deceptively include far more cellulose than necessary because it's cheaper than cheese.

That "100% Parmesan" label really means "100% of the cheese *portion* of the ingredients is parmesan." But even this is true only in the U.S. and Canada. This label would be fraudulent under the laws of Europe, where authentic parmesan can only be made in the Parma region of Italy using a traditional process and ingredients. North American grated "parmesan" is not the same cheese.

Similarly, most North American sushi lovers have never tasted genuine wasabi. The spicy green paste that typically comes with sushi is an artificially colored imitation made from horseradish.

Staying Ahead of the Law

Food companies are always inventing new ways to make money—sometimes through trickery. New kinds of deception may be legal for years before laws can catch up.

Consider the common practice of injecting uncooked chicken with a brine of salt water and protein. The chicken industry says that this "brining" or "plumping" is a normal part of the meat packing process and makes chicken juicier and tastier for customers. However, adding water also increases the size and weight of chicken meat. Customers are fooled into paying chicken prices for nearly worthless water. In South Africa, for example, investigators found that some chicken was inflated with up to 50 *percent water*! This was an outrageous level of cheating. In 2019, South Africa passed a new law: chicken may not be "plumped" by more than 15 percent brine, and brining must be clearly stated on the label. (Many countries have passed similar laws. In the U.S., any amount of brining must be declared on the label.)

Criminal Food Fraud

Many parts of our food supply are tightly controlled and reliable. However, criminal food fraud still does happen. Amazingly, fraud is most common in some of the same areas that plagued the Romans, including spices, wine, and honey.

It's still easy to illegally mix spices with cheaper plants without anyone noticing. For example, recent tests have found that a quarter of dried oregano sold in the United Kingdom and the U.S. is mixed with cheaper plants. Another DNA study found that a third of herbal teas included plant materials not listed on the label. As the scientist who led the tea tests pointed out, "As a consumer, there is no easy way to look at a bunch of dried twigs and tell what they are."

Most alcohol products are authentic. However, daring criminals can make fortunes selling counterfeit wines. Italian police busted one ring of wine fraudsters in January 2020. The crooks blended bad wine, sugar, water, and flavorings to fake over a million liters of supposedly high quality wine. Other wine frauds target wealthy wine collectors. One scammer made millions selling counterfeit bottles of superrare old wines. He was eventually caught and sent to prison.

Olive oil is expensive, and it "can easily be diluted or substituted with cheaper oil," warns the Canadian Food Inspection Agency (CFIA). One third of samples tested by the agency in 2006 failed. Some were blended with cheaper oils such as canola. In the U.S.A., a 2010 study found that 69 percent of supposedly top quality imported "extra virgin" olive oil was actually lower quality. Police in many countries have busted olive growers, oil sellers, and criminal gangs for olive oil fraud schemes.

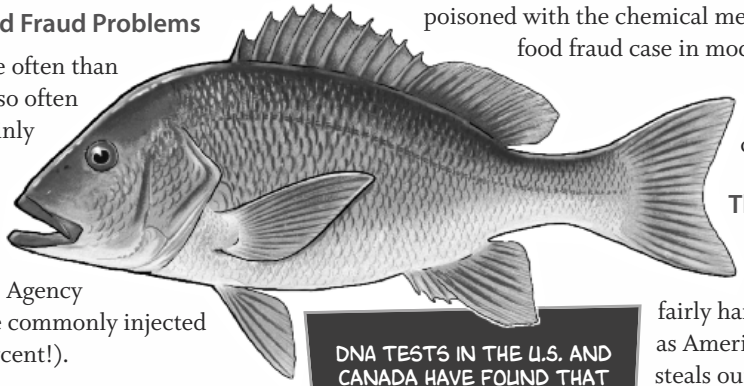
Honey is still fraudulently adulterated with cheaper sugars, just as it has been for centuries. The CFIA tested 240 suspicious honey samples in 2018. Every tested sample of Canadian honey was authentic, but 22 percent of imported honey was mixed with sugar. Honey fraud is big business. In 2008, U.S. federal agents broke up an 80 million dollar scheme to sell banned and adulterated Chinese honey in the U.S.A.

A giantic meat scandal rocked Europe in 2013. Numerous countries discovered that widely sold "beef" products such as frozen hamburgers were mixed with horse meat. This was very upsetting for people who consider horses companion animals. This infamous scandal alerted many governments to the true scale of the ongoing problem of food fraud.

One of the easiest cheats is just to slap on labels that make food appear more valuable. One Canadian company was fined several million dollars for putting "Grown in Canada" stickers on vegetables from Mexico. In 2019, an American schemer was sentenced to 10 years in prison for selling 120 million dollars of corn and soybeans that were dishonestly labeled "organic."

The Moby Dick of Food Fraud Problems

Seafood is faked more often than any other sort of food—so often that you've almost certainly been cheated yourself. Some seafood is deceptively altered. For example, 2002 tests by Britain's Food Standards Agency found that scallops were commonly injected with water (up to 54 percent!).



DNA TESTS IN THE U.S. AND CANADA HAVE FOUND THAT BETWEEN 44% AND 100% OF "RED SNAPPER" SAMPLES WERE REALLY OTHER KINDS OF FISH.

Mislabeled seafood is an even bigger problem. Sellers often substitute cheap fish for expensive fish. The nonprofit organization Oceana buys fish from stores and restaurants, then uses DNA tests to find out if it is really the species claimed on the label or menu. Their 2012 tests of fish sold in New York City revealed that 39 percent of samples were mislabeled. Restaurants were less reliable than grocery stores; customers usually can't tell which fish is used in sushi or cooked dishes. *Every single tested sushi restaurant served mislabeled fish!* Oceana also tested fish samples from cities across Canada in 2017 and 2018. About one in five grocery store fish samples were mislabeled, as were *half* of the fish samples from Canadian restaurants! "Wild Pacific salmon" often turned out to be farmed Atlantic salmon. "White tuna" was often escolar (a fish that can make people sick). Every single sample of Red Snapper tested in Canada was really some other cheaper fish.

These frauds cheat customers *and* harm the oceans. In some cases, customers are even served endangered species without realizing it! Fraudsters often hide where seafood comes from. Imported seafood is often illegally poached or fished unsustainably, then disguised to look like it comes from a responsible fishery. Governments, scientists, and ocean organizations are working to fix that problem. People can't make informed choices if they don't know what they're eating or where it comes from.

Deadly Deceptions

Modern food fraud isn't as dangerous as it was in Accum's day, but it can harm people in some cases. Food experts worry that people with life-threatening allergies could eat dangerous hidden ingredients (such as peanuts).

In 2007, two people in Chicago were poisoned by toxic puffer fish that was sold as harmless "monkfish." They were lucky to survive. The FDA seized hundreds of boxes of the poisonous fish. In 1986, dozens of wine drinkers were hospitalized and 20 died after drinking fraudulent wine. Food criminals used a poisonous kind of alcohol to make shoddy wine more intoxicating.

China was shocked in 2008 when fraudulent milk was poisoned with the chemical melamine. This was the worst food fraud case in modern history. Over 50,000 children were sent to the hospital! Tragically, several children died.

The Bottom Line

Food fraud affects everyone, rich and poor. It unfairly harms honest businesses such as American beekeepers. Cheating steals our money and sometimes harms our health. It also takes away our freedom to make choices. People who care about animal welfare, organic farming, the environment, or a balanced diet depend on honest food labeling. The same is true for people with allergies or dietary restrictions, such as vegans, vegetarians, celiacs, and those who eat kosher or halal food.

What can we do? Customers can detect many food tricks by reading labels and thinking critically. If prices seem too good to be true, they probably are! We can seek out reputable brands. (Oceana's tests found that national grocery chains had much more reliable fish labeling than smaller grocers.) We can grow our own herbs and cook with hard-to-fake ingredients such as fresh vegetables and whole fish.

Outright criminal fraud is another story. We need scientists and law enforcement to catch serious food criminals. In that ongoing battle, we can cheer on the scientific food detectives who are on the case!

FURTHER READING

TO LEARN MORE ABOUT MODERN FOOD FRAUD, SEE LARRY OLMSTED'S *REAL FOOD, FAKE FOOD* (2016). FOR AN EXCELLENT LOOK AT THE HISTORY OF FOOD FRAUD, SEE BEE WILSON'S *SWINDLED—FROM POISON SWEETS TO COUNTERFEIT COFFEE—THE DARK HISTORY OF THE FOOD CHEATS* (2008). BOTH WERE IMPORTANT SOURCES FOR THIS STORY.

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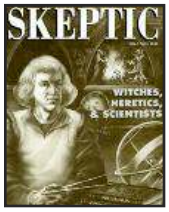
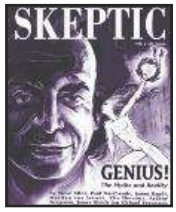
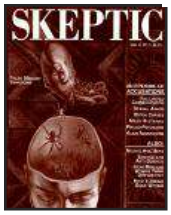


magv1n4-Witches, Heretics, and Scientists and the Psychology of Resistance to New Ideas: Today's Heretic, Tomorrow's Saint *by Clayton Drees*; Spirits, Witches & Science *by Richard Olson*; Resistance to Heretical Science of Copernicus *by M. Shermer;* Ideological Immune System *by J. Snelson*; Edgar Cayce Foundation Responds to Skeptics & We Reply; Can Religion be Rational? *by C. Brough*; Reviews.

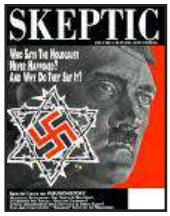


magv2n1-Genius: Myth & Reality: Genius *by Steve Allen, James Randi, Paul MacCready, Elie Shneour; Marilyn Vos Savant; James Gleick* (on Feynman); Amadeus Myth *by M. Shermer*; *D. Alexander* (on Gene Roddenberry); Review of Genius, *by M. Rothman*; "Science" of Noah's Ark *by D. Porter*; Who & What Mattered in History *by M. Shermer*; Mathemagics *by A. Benjamin*; Millennium Watch *by T. Daniels*; Reviews.

magv2n2-Science, Religion, & Cults: The Jesus Cults *by Steve Allen;* What Makes A Cult? *by C. Kisser;* Millennium Watch *by T. Daniels;* The Resurrection Myth *by S. Harris;* Was Christianity a Cult? *by G. Larue;* Realism & Religion *by M. Rothman;* The Unlikeliest Cult Of All *by M. Shermer;* Mathemagics *by Auther Benjamin;* Ark Hoax; 25 Creationist Questions & 25 Evolutionist Answers; Reviews.



magv2n3-Fad Psychology, False Memory, Facilitated Communication: False Memory Syndrome *by Hochman;* Diagnoses are not Diseases *by Szasz;* Facilitated Communication *by Green;* William Reich *by Morrock & Carlinsky;* Sex, Brains, & Hands *by Halpern;* How Thinking Goes Wrong *by Shermer;* Pseudoscience in Psychiatry *by Tavris;* Anti-Science *by McDonough;* Flood Myths *by Larue;* Ark Hoax *by Lippard & Bloomberg.*



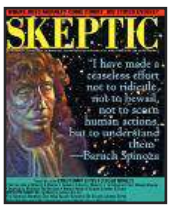
magv2n4-Pseudohistory-Afrocentrism and Holocaust Revisionism: Free Speech & Neo-Nazis *by Miele;* Denying the Holocaust review *by Siano;* Holocaust Revisionism *by Shermer;* Creationism & Racism *by McIver;* Goodbye Columbus? *by Fritze;* Were Egyptians & Greeks Black? *by Lefkowitz;* Beyond Race *by Appiah.* Noah's Ark Hoax Update *by Lippard;* Randi on the Millennium; Reviews.

magv3n1-Pseudomedicine: Update False Memory Syndrome; Homeopathy *by Jarvis;* Alternative Healthcare *by Raso;* Therapeutic Touch *by Rosa;* Skeptics & Religion *by Drees*; *Shallit* on Leftist Science; Mattoon Mass Hysteria *by Smith*; Liquefying "Blood" *by Randi*; Star Trek's Meaning *by Shermer*; Is Raw Meat Conscious? *by Leikind; Huston* reviews books on Miracles, Conspiracies & Skinheads.

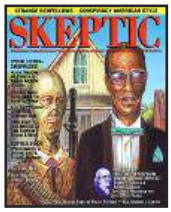
magv3n2-AIDS: AIDS Heresies *by Harris;* Astrology Brouhaha *by Randi;* Should the Bible be Taken Literally? *by McCollister;* Extraordinary Claims Require Extraordinary Evidence? *by Schick, Jr.;* Charles Murray Interview *by Miele;* Wallace & Darwin's Priority Dispute *by Shermer;* Culture Wars: Skeptics, Parapsychologists & New Agers *by Siano;* Debunking Hal Lindsay *by Callahan;* Did God Make Rice Cakes? *by Leikind; Reviews.*

magv3n3V Race & IQ: Place In The Sun *by Tavris.* Bell-Shaped Curve's Skewed Logic by *Halpern.* Sternberg *interview by Miele.* Insult to Injury: Uses of *The Bell Curve by Griffin.* Defending *The Bell Curve, by Sarich.* Cycles & Curves by Shermer. Scientology v. the Internet *by Lippard & Jacobsen.* King Tut's Curse *by Randi.* Moral Panics *by Victor.* "Recovered Memories" *by Pendergrast.* How to Eat a Light Bulb *by Leikind;* Reviews.

magv4n1-Evolutionary Psychology: Stephen Jay Gould Interview, Lionel Tiger, & Robin Fox. (Im)moral Animal *by Miele;* Sociology as Alchemy *by Salter;* Beyond Just-So-Stories by *Holcomb;* How Humans Got Spots *by Schlinge;.* Gould's Dangerous Idea *by Shermer;* Darwin Dangerous? *by Ruse;* Randi debunks Quadro tracker; Creationist museum; Scientology responds; What Is the Ant, Sir? *by Leikind;* Reviews.


SKEPTIC
"I have made a ceaseless effort not to ridicule, not to bewail, not to scorn human actions, but to understand them."
—Baruch Spinoza

magv4n2-Evolutionary Ethics: Science of Morality *by R. Bingham*; *F. Miele* interviews Garrett Hardin; Morality & Genetic Engineering *by J. Hartung*; Evolution of Morality & Religion *by W. Irons*; Plants & Property *by A. Oubre*; Ethics Without Religion *by Shermer*; *William Jennings Bryan's* Argument Against Evolution; Superstition *by Olson*; Randi debunks saving fuel device; Cosmythology *by V. Stenger.* Adam's IQ *by Leikind.*



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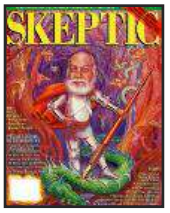
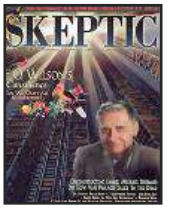
magv4n4-Is History A Science? Tribute to Carl Sagan: Can History Be Science?; F. Sulloway on *Born to Rebel;* Early Ghost-busters; Debunking Nostradamus; Critical Thinking About History; Norm Levitt Replies to Critics; R. Olson on Left & Right Science; What Happened to N-Rays?; Randi-How To Be Psychic: Im-moral Creationism. Reviews: Evolution & Literary Theory; Killing of History; Amazing Kreskin. Dumbth News.



magv5n1-Ecology: Economists v. Ecologists *by F. Miele*; Scientists' Warning to Humanity; Julian Simon Interview; Not-So-Wise Use Movement *by P. Lindholdt*; Population Risk Assessment *by E. Shneour*; Myth of the Beautiful People by M. Shermer; Ancient Astronauts by E. Wojcie-howski; Dumbth News by R. Cassing-ham; Modern Demonology by F. Crews. Randi's *Swift*: Dowsing, Human Magnetism, Pigasus Awards, Futurists.

magv5n3-Anthropology: Interview: Donald Johanson; Human Origin Stories *by Miele*; God & Ghost Dance *by Shermer*; Mead & Anthro. *by Freeman*; Indians v. Archaeologists *by Feder*; Millennium *by Stephen Jay Gould*; Dumbth News *by Cassingham*; Di Conspiracies *by Gerlich*; X-Files Meets Disney *by Mc-Donough*; Houdini v. Margery *by Polidoro*; Fairies Frauds *by Randi*; Alternative Medicine *by L. Jaroff*; Reviews.



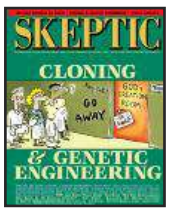
magv6n1-Science & Society: E.O. Wilson Interview *by F. Meile*; Review of Wilson book *by B. Siano*; Van Praagh-How He Talks To the Dead *by M. Shermer*, plus Commentary *by G. Posner*; Skeptical Of Objective Journalism *by A. Kitty*; GRE As Fringe Science *by K. Oldfield*; Drug Policy Debate Guide *by E. Goode*; Fraud In the Name of Religion? *by M. Fried*; New Age High Tech *by J. Randi*; Dumbth News; Evil Eye *by G. Bohigian*; Reviews.

magv6n2-Taking God Seriously: Deepak Chopra Danger *by P. Molé*; Ray Hyman Interview; Atheist v. Agnostic *by Shermer*; Karl Popper On God; TT Wars *by L. Sarner*; Against God *by M. Pigiucci*; For God *by B. Mazet*; Answering Creationists *by T. Edis*; Intellectual Danger by *J. Randi*; Self-Help Coach *by D. Lease*; '97 Dumbth Awards *by R. Cassingham* • Jr. Skeptic: TT & Me *by E. Rosa*; Lucky 7 *by E. Antisdale*; Web reviews *by C. Walker & S. Kinney.*

magv6n3-Why Professors Believe Weird Things: Sex, Race, & the New Left *by N. Levitt*; Susan Blackmore Interview; Is God Dead? *by M. Shermer*; Meme Critique *by J. Polichak*; Alternative Religion Supporters *by S. Kent & T. Krebs*; Facilitated Communication *by B. Gorman*; Snake Oil Psychotherapy? by T. Dineen; *Randi* on True Believers, Waco. Jr. Skeptic; Bigfoot! *by Harter*; Crystals *by A. Chesworth*; Golfball Finder *by Cohen.*

magv6n4-JFK: Jack Horner Interview; JFK-Facts & Fictions *by N. Gerlich*; JFK-Case Still Open *by A. & M. Snyder*; Pope & Science *by M. Shermer*; Anastasia: Miraculous Survival Myth *by T. Callahan*; Dumbth News *by R. Cassingham*; Dowsing Challenge *by Randi*; Ig Nobel Awards *by S. Gibson* • Jr. Skeptic; Aliens Among Us? *by A. Chesworth*; Abducted! *by M. Shermer*; Psychic Math! *by A. Benjamin*; UFO Photos

magv7n1-Influence: Carol Tavris Interview; Fraud & Science *by D. Kevles*; Biologist Views Belief *by K. Parejko*; Christian Science & Quantum Physics *by R. Miller*; Hypnosis Reconsidered *by B. Seidman*; Public Relations *by B. Siano*; Communication's Hidden Dynamics *by D. Brenders*; The Knowledge Filter *by M. Shermer*; Alternative Medicine *by H. Ziel*; *Randi* Addresses Congress; Dumbth *by R. Cassingham*; Jr. Skeptic: Fortunetelling.



magv7n2-Cloning: Science, Ethics of Cloning *by F. Miele*; Cloning & Science's Moral Limits *by M. Shermer*; Richard Seed Interview; Evolution Information *by R. Dawkins*; Evil & Group Selection *by N. Thompson*; Theology & Evolutionary Psych *by K. Konkola & G. Sunshine*; Fake Quotes *by J. George*; Medical Discoveries? *by H. Ziel*; Population Myths *by D. Henige*; Humor *by S. Asma & D. Lease*; *Randi's* Pigasus Awards; Jr. Skeptic: Urban Legends.

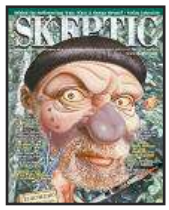
magv7n3-Millennium: *T. Dufresne* Interviews Frederick Crews; Search for Immortality *by A. Herd*; Creation & The End *by T. McIver*; Celestine Prophesy *by P. Molé*; Millennial Meanings *by M. Shermer*; That's All Folks! *by D. Lease*; Randi Comments; Dumbth *by R. Cassingham*; Educashun by S. Asma; Myth & Science *by T. Callahan*; Political Extremism by *L. Hyman.* Jr. Skeptic Halloween; Autopsy Aliens. Haunt Houses by B.Friedhoffer

magv7n4-Pseudoscience: Interview of Phil Klass *by Posner*; Sagan Bios *by Shermer & Morrison*; Holistic Healing *by Molé*; Phantom Assailants *by Bartholomew & Goode*;Satan Panic *by Wade*; Penis Panics *by Bartholomew*; Eye Movement Therapy *by Rosen,* Sai Baba *by Gogineni*; Thought Field Therapy *by Swenson*; *Lilienfeld & McNally*; Photo ESP *by Kauffman & Brown*; Psi Missing *by Riniolo & Schmidt*. Jr. Skeptic: TV Psychics.

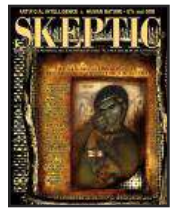
magv8n1-Race & Sports: Black Domination *by J. Entine*; Race Sports Myths *by J. Hoberman*; Race Differences *by V. Sarich*; Meaning of Dominance *by M. Shermer*; Ernst Mayr Interview *by F. Sulloway & M. Shermer*; Free Energy *by R. Park*; Nonzero /Human Gaia*by D. Wilson*; Chiropractic *by S. Homola*; Attention Deficit Disorder *by J. Leo*; Geller Compass Trick *by Randi*; Mind/Body Problem *by W. Lee*; Women Skeptics? *by S. Gibson*; Jr. Skeptic: Darwin by P. Linse.

magv8n2 Skepticism & Religion: Frans de Waal Interview *by M. Shermer;* Agnosticism *by S. Dawson;* Skeptic's Faith? *by B. Wildish;* Scope's Trial Revisited *by T. Riniolo & L. Torrez*; Bible Belt *by G. Sloan;* Influence & Scientology by *D. Martin;* Bible/Nature *by E. Zerin*; Life's Meaning *by D. Naiditch;* Existence *by H. Vahidi & S. Friberg;* Personal Gods *by M. Pigliucci*; Prayer Heals? *by W. Matthews, T. Christ & J. Conti;* Randi; TV *by S. Gibson* • Jr. Skeptic: Pyramids.

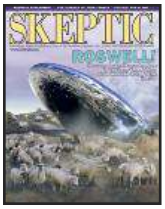
magv8n3-Chaos & Complexity: Jared Diamond Interview *by M. Shermer;* Quick Introduction to Chaos Theory *by F. Miele*; Chaos Skepticism *by M. Pigliucci;* Contingencies *by M. Shermer;* Latest Cosmology *by R. Ebert*; Complex Systems *by L. Lam;* Darwin Bumper Fish *by S. Gibson*; *Randi* on Cold Reading; Reverse Speech *by W. Langstoni & J. Anderson*; Cultural Relativism *by R. Bartholomew*; Stephen Jay Gould Festschrift.



magv9n1-Anthropology Wars: Steven Pinker Interview; Intro to Anthro Wars *by F. Miele;* Science v. Spin Doctoring in Anthro Wars *by M. Shermer*; "Noble Savage"? *by P. Frank*; Margaret MeadAnthro Controversy *by P. Shankman*; Testing Mediums *by J. Randi*; Belief & New Transcendence *by D. Brin;* Velikovosky at 50 *by D. Morrison*; New Atlantis *by G. G. Fagan & C. Hale*; Jr Skeptic: Did We Go To the Moon? *by P. Linse*



magv9n3-A.I. &Theology of UFOs: Artificial Intelligence *by S. Harris;* Theology of UFOs by *B. Denzler;* Education Doesn't make Skeptics *by W. R. Walker, S. J. Hoekstra, and R. J. Vogl*; Accelerated Learning *by L. K. Hagan*; How Smart People Sabotage Thinking *by P. Molé*; Neo-Confederates *by C. M. Center*; Peers & influence *by B. Markovsky & S. R. Thye*; Freud, Darrow, & the Leopold/Loeb Trial *by T. C. Riniolo.* Plus Randi, Dumbth, Jr. Skeptic.



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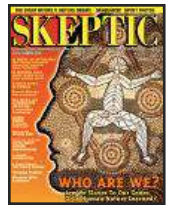
magv10n2-Stephen Wolfram's Science *by D. Naiditch*; Are We Getting Dumber? *by R. Ehlich*; Why Smart People Believe Weird Things *by M. Shermer*; Can the Media Help Science? *by H. N. Pollack*; The Media Harms Science *by S.Waxman*; Psychic Grief Counselors by *R. Freedman*; Randi; Mystery Balls *by R . Saberi*; *B. Muller*-Humor; John Edward Seminar *by B. J. Phelps, S. Pedersen E. Wogen*; Test Sylvia Brown by *B. Farha:* Jr. Skeptic: Yeti *by Loxton*



magv11n2-Nature v. Nurture Human Nurture *by H. D. Schlinger*; A Consilient View of Human Behavior *by F. Miele*; Are Sports Streaks Random? *by A. Bernardin*; Alternative Health Journalism *by C. Bowerman*; A New Chronology of History *by J. Colavito*; Spiritualists Prove Religion With Science *by P. Firenze;* How to Investigate *by J. Randi*; Politicization Of Science *by D. O. Krider*; Mexican UFOs *by J. C. Smith*; Cryonics *by G. Benford;* Jr.Skeptic: Sasquatch *by D. Loxton*

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magv12n2-Artificial Intelligence Quest *by P. Kassan;* Design Illusion*by R. Dawkins*; Dover ID Trial *by B. Humburg & E. Brayton;* ID as Scienti-fic as SETI? *by R. Camp*; Young Earth Creationists *by J. Rosenhouse;* Other ID Theories *by D. Brin*; Ted Serios's Camera Brain *by C. Campbell;* Omnitron *by Randi;* Coral Castle Enigma *by W. Stansfield.* Jr Skeptic-Pyramid Power *by D. Loxton.* Reviews: 9/11; Privileged Planet Film; Republican War on Science

magv13n3-Medical Controversies: Flawed Psychiatry *by J. Sorboro*; Reading Medical Research *by H. Hall;* Secondhand Smoke Debate: *S. Zion v. H.Hall;* Animal Research *by N. Shanks, R. Greek, N. Nobis, & J. Swingle-Greek;* Vaccine-Autism Myth *by M. Normand & J. Dallery;* Science Disputes/AIDS Origin *by B. Martin*; *Randi* on S.Harris; Cold Cures *by Hall;* Bonobo Politics *by F. de Waal;* Cosmology & ID *by Pilpel;* JR SK: Alien Astronauts

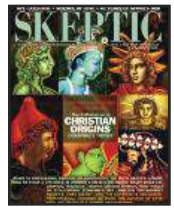
magv13n4-Quirkology: Odd Science of Everyday Life by R. Wiseman; Afterlife Debate: D. Chopra v. M. Shermer; Dawkins is Wrong About Religion by D. S. Wilson: Dawkins Replies; New ET Myths by Tim Callahan; Can Apes Learn Language? by C. Wynne; Franklin's Kite a Hoax? by W. D. Stansfield; Mozart Effect Myth by W. Dowd; Consciousness by H. D. Schlinger; Reviews: Levitt; Hall; Paranormal. Jr. Skeptic: Alien Astronauts II *by D.Loxton*

magv14n1-Global Warming: G W Skepticism by *P. Frank;* How We Know Warming Is Real by *T. Schneider;* Global Warming Solutions by *W.Calvin;* Hydrogen by *A. Friedemann;* Last Chance to Win $1,000,000 by *J. Randi*; Detox Quackery by *H. Hall*; Houdini & Séance Fraud by *S. E. Rivkin;* Kong & Nessie by *D. Loxton*; Journalism's Flaws by *S. Salerno;* Supernatural Claims by *C. T. Palmer, K. Coe,* & *R. L. Wadley,* Reviews. Dragons *by Loxton*

magv14n2-Is the Evolution of Intelligence Likely to Happen Again On Earth or On Other Planets?; Grief Stages a Myth? Criminal Profiling; Near Death Experiences; Phoenix Lights; Behind the Anti-science Film *Expelled:* 9/11 Conspiracy; Popular Medical Fallacies; Dyson & the Paranormal. Reviews: Snake Oil, Suckers; Perceptual Distortion; Arguments for God; Postmodern Misadventures; DNA Evolution; Spiritual Brain; Jr. Sk: Crystal Skulls.

magv14n3-New Revisionism: if Hitler Had Won by M. Shermer; Skeptical of Evolved Altruism by K. W. Krause; Twins Experts Interviewed On Behavior Genetics and Evolutionary Psychology by F. Miele; New Look at Out-of-Body Experiences by J. A. Cheyne; Germ Theory Denial by H. Hall; Near Death Expereinces by S. Dieguez;ID's Machine-like Flagella a Myth by M. Perakh; Wolfram Revisited by G. Neske; Reviews. Jr. Skeptic: Great American Skeptics.

magv14n4-Ponzi: Ponzi Scheme Psychology *by S. Greenspan.* FAITH HEALING: Medicine *by K. W. Krause;* Benny Hinn *by R. Shaffer;* Peter Popoff *by M. Carrier.* Self-Esteem Myths *by S. Salerno;* Gulf War Syndrome *by H. Hall; Randi* on Double Blind Studies; Evaluating Science Claims *by R. M. Barnes, A. L. Alberstadt,* & *L. E. Keilholtz;* Global Warming Consensus *by G. Whittenberger.* Reviews. Jr. Skeptic: *I. Rowland*'s Psychic Cold Reading.



magv15n1-Christian Origins Conspiracy Matt Ridley Interview; Atheism a Stealth Religion?; Hugh Ross v. Michael Shermer; Morristown UFO Hoax; Randi on Firewalking; Internet Matchmaking; Ape Language Controversy; Testing Orgone Energy; SkepDoc on Homeopathy, Placebo Effect; Flawed Justice System; Teach Critical Thinking. REVIEWS: Core theory; Science of Love; Metaphysical Mind; Film: Oppenheimer. JR SK: Scooby-Doo

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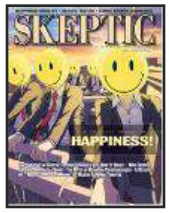

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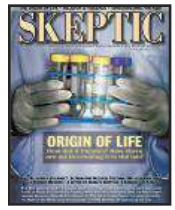

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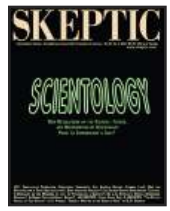

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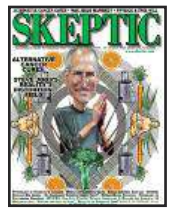

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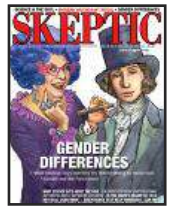

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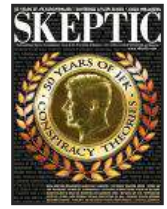

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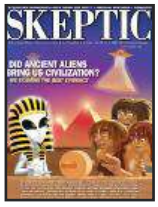

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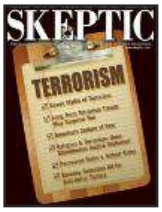

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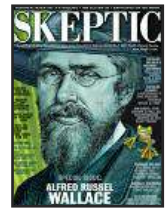

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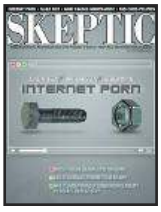

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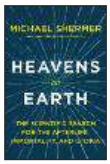

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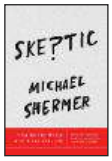

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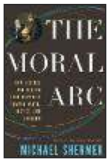

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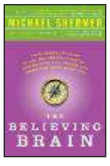
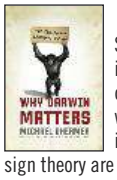


The Believing Brain…How the Brain Constructs Beliefs & Reinforces Them as Truths by Michael Shermer. (b149HB $28. hardback) (b149PB $15.95 paperback.) How beliefs are born, formed, nourished, reinforced, challenged, changed, and extinguished. From our superstitions to our politics, and economics. The neuroscience behind our beliefs, real-world examples of belief from all realms of life, and why science is the best tool ever devised to determine whether or not a belief matches reality.

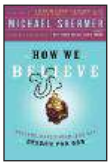
Why People Believe Weird Things by Michael Shermer. (PB062 $17. paperback) Witty & eloquent. A no-holds-barred assault on mass delusion, prejudice, & gullibility. UFOs, ESP, Near Death Experiences, Alien Abductions, Recovered Memories, Creationism, Holocaust Denial, Race, God, & Science v. pseudoscience. A classic & a best seller.

Borderlands Of Science by Michael Shermer. (PBB069 $29.95. paperback. **Hardback on sale at $10.00 each**) Where does valid science leave off and borderland science begin? Examines the theories, the people and the history involved in areas of controversy where sense is in danger of turning into nonsense.



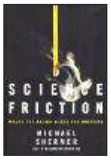
Why Darwin Matters by Michael Shermer. (b111PB $13. paperback) An insiders' guide to the evolution/creation debate—what evolution really is, how we know it happened, and how to test it. Why creationism and Intelligent Design theory are not science. Why 50% in U.S. reject evolution—spiritual, psychological and political reasons, such as moral relativism and social Darwinism.

Soul of Science by Michael Shermer. (b109PBB $5.) Shermer's popular lecture & inspirational essay as a pocket booklet. How can we find spiritual meaning in a scientific worldview? Religion may be the most common source of spirituality, but anything that generates a sense of awe may be a source of spirituality. Science does this in spades.

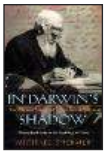


How We Believe (b063PB $16.00 paperback) by Michael Shermer. An empirical study of 10,000 Americans—why do people believe in God?; science & religion controversies; proofs of God; did religion evolve?; deeper millennial destruction-redemption meanings; finding meaning in life; how people assume that others believe for different reasons than they do.

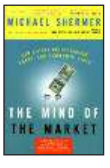
The Science Of Good and Evil: Why People Cheat, Gossip, Care, Share, & Follow the Golden Rule by Michael Shermer. (PB085-paperback $17.) Broad in scope, deep in analysis, and controversial. Is it human nature to be selfish or selfless, fierce or loving, moral or immoral? Scientific evidence shows that morality is deeply embedded in our being and behavior. Explores how science can address some of our most difficult moral dilemmas.



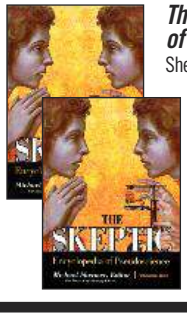
Science Friction: Where the Known Meets the Unknown by Michael Shermer. (**SALE: $10. 100HB**) Shermer becomes a psychic for a day, investigates quack cancer & alternative medicine, evolutionary psychology and the mutiny on the Bounty, chaos theory and history, intelligent design creationism, sports psychology, and more. Lively and fun reading.



In Darwin's Shadow: The Life & Science of Alfred Russel Wallace by Michael Shermer (HB081 $55. hardback) A landmark biography of the co-discoverer of natural selection & the greatest naturalist of his age. Shermer applies modern psychological theories to understand why Wallace also crossed disciplines to become involved in spiritualism, seances, & life after death belief systems.



Mind of the Market by Michael Shermer. (b126PB $15. paperback) Integrates behavioral economics, neuroeconomics, & evolutionary economics, expanding the application of science & skepticism to reveal that humans are just as irrational when it comes to money & markets as they are in other areas.



The Skeptic Encyclopedia of Pseudoscience by Michael Shermer, Ed./Pat Linse, Con. Ed. TWO VOLUMES, $129.00. (save over $50.00 off the library price. Hardback. b082HB) Four parts: (1.) A-Z topic listings. (2.) Case Studies: In-depth analyzes. (3.) Pro & Con" debate section. (4.) Historical Documents. Bibliography, Illustrated

DVDs

The Atheism Tapes av571DVD. $29.95 *(2 DVD set)* A Documentary Extra with Jonathan Miller Neurologist, playwright, filmmaker & self-described atheist. Conversations with six of today's leading men of science and letters: Richard Dawkins, philosophers Daniel Dennett & Colin McGinn, playwright Arthur Miller, theologian Denys Turner, and Nobel laureate physicist Steven Weinberg. These distinguished thinkers discuss their personal intellectual journeys & offer illuminating analyses of belief & disbelief from a wide range of perspectives. Compelling viewing you won't want to miss.

THE ROOT OF ALL EVIL? The Original TV Documentary av568DVD. $19.95. (2-DVD set) Two-part documentary ("The God Delusion" & "The Virus of Faith") plus Bonus Features: Commentary; Q&A; and a reading from *The God Delusion*, all by Richard Dawkins. Examines the power of religion, an interview with former Pastor Ted Haggard, novelist Ian McEwan, the former Bishop of Oxford, & others offer insights into the impact & consequences of faith in the 21st century.

Root of All Evil? The Uncut Interviews av569DVD. $24.95 *(3 DVD set)* During the filming of *Root of All Evil?*, Richard Dawkins conducted many fascinating interviews. The footage was edited, and some entire interviews had to be omitted. Here are eight raw and uncut interviews, allowing the viewer a rare vantage point see these revealing exchanges. Interviews with: Jill Mytton; Ian McEwan; Bishop Richard Harries (Watch this interview free online at skeptic.com); Michael Bray; Hell House Pastor Keenan Roberts; Alister McGrathl; Adrian Hawkes; & Rabbi Gluck.

The Great Debate-Does God Exist? av558DVD (DVD only-$23.95) Dr. Doug Geivett, Professor of Philosophy at Talbot School of Theology at Bioloa University v. Dr. Michael Shermer, Skeptic magazine, Director, Skeptics Society. Dr. Geivett presents the best theological, philosophical, and scientific evidence for God's existence. Dr. Shermer counters these arguments, then presents the best scientific evidence that God and religion are human creations. Remarkably enlightening and entertaining! Lively Q & A.

Growing Up in the Universe av570DVD. (2-DVD set) ($19.95) Richard Dawkins presents a series of lectures on life, the universe, and our place in it. With brilliance and clarity, Dawkins unravels an educational gem that will mesmerize young and old alike. Illuminating demonstrations, wildlife, virtual reality, and special guests (including Douglas Adams) all combine to make this collection a timeless classic. Originally presented as part of the Royal Institution Christmas Lectures for Children were founded by Michael Faraday in 1825.

Brain, Mind and Consciousness (av560DVD) FREE WITH ANY DVD ORDER! 3 DVDs. About 7½ hours. Skeptics Society conference hosted by Michael Shermer and Roger Bingham. Christof Koch on neurobiology; Alison Gopnik on how brains learn; Richard McNally on false memory; Terrence Sejnowski on sleep & subconscious; Susan Blackmore on altered states; John Allman neurobiology of emotion; Paul Zak on behavioral economics; & Ursula Goodenough on morality.

Break the Science Barrier av577DVD. $15. A 1 hour film by Richard Dawkins. Communicates the power and the beauty of science including the discovery of the Big Bang, junk science in the courtroom, magic and deception, and how science is the best tool ever devised for understanding how the world works. Includes a delightful interview with Douglas Adams and magician Ian Rowland, who reveals how easy it is for any of us to be fooled by both magic & superstition.

Penn & Teller's Bullshit

(first season) av553DVD ($39.99) by Penn & Teller. A 13 episode boxed set of 3 DVDs from their TV show. The masters of in-your-face entertainment debunk everything from designer water to aliens to "alternative medicine." Outrageous!

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(av556DVD $34.98) 4 hours. An examination of the questions raised by theism and atheism seen through the lives of Sigmund Freud and C. S. Lewis, with roundtable discussion by Dr. Michael Shermer & eight other panalists.

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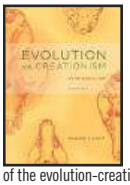
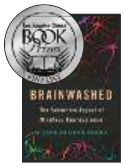
A beautiful boxed set of 7 DVDs. (av554DVD $129.98) The original13 hour series narrated in 1980 by Carl Sagan updated in 2000 with new science and images. The definitive tour of our universe. Inspiring! A classic!

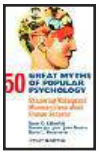
Other Fascinating Topics



Evolution vs. Creationism: An Introduction by Eugenie C. Scott. The debate over teaching evolution continues in spite of the emptiness of the creationist positions. This accessible resource, now completely revised and updated, provides an essential introduction to the dispute's many facets—the scientific evidence for evolution, the legal and educational basis for its teaching, and the various religious points of view—as well as a concise history of the evolution-creationism controversy. Cat.No. b160PB ($29.95 Paperback)

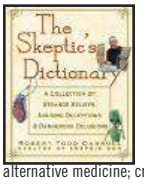


Brainwashed: The Seductive Appeal of Mindless Neuroscience by Sally Satel and Scott O. Lilienfeld. What can't neuroscience tell us about ourselves? Since fMRI was introduced in the early 1990s, brain scans have been used to help politicians understand and manipulate voters, determine guilt in court cases, and make sense of everything from musical aptitude to romantic love. But although brain scans and other neurotechnologies have provided groundbreaking insights into the workings of the human brain, the increasingly fashionable idea that they are the most important means of answering the enduring mysteries of psychology is misguided—and potentially dangerous. Cat.No. b159HB-($26.99 HB)



50 Great Myths of Popular Psychology by Scott O. Lilienfeld, Steven Jay Lynn, John Ruscio, and Barry L. Beyerstein. Do we use only 10% of our brains? Of course not, but this, and 49 other myths, have made their way into the brains of millions of people through pop culture. Three world-class psychologists deconstruct the myths, show how they got started, and explain why they're wrong. Includes critical thinking skills; a mythbusting kit; 200 additional psychological myths and an appendix of useful Websites; and last but not least, psychological findings that sound like myths but are actually true. Engaging and accessible. Cat.No. b158PB. ($29.95 paperback)

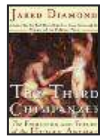
Mistakes Were Made (but not by me): Why We Justify Foolish Beliefs, Bad Decisions, and Hurtful Acts by Carol Tavris and Elliot Aronson. Why do people dodge responsibility when things fall apart? Why the parade of public figures unable to own up when they screw up? Why the endless marital quarrels over who is right? Why can we see hypocrisy in others but not in ourselves? Are we all liars? Or do we really believe the stories we tell? Two of the world's greatest social psychologists answer these and other questions. Cat. No. b157PB ($15. paperback)



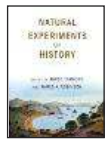
The Skeptic's Dictionary by Robert Carroll. (b086 PB $19.95) Based on Carroll's website: skepdic.com, the Dictionary is the definitive short-answer debunking of nearly everything skeptical. Nearly 400 definitions, arguments, and essays on topics ranging from acupuncture to zombies. A lively, commonsense trove of detailed information on all things supernatural, occult, paranormal, and pseudoscientific. It covers such categories as alternative medicine; cryptozoology; extraterrestrials and UFOs; frauds and hoaxes; junk science; logic and perception; New Age energy; and the psychic. Should be on every skeptic's book shelve. An invaluable reference.

Secret Origins of the Bible by Tim Callahan. b079PB $19.95 Many otherwise well informed readers will find much of the material in this book quite startling, although Bible scholars and comparative mythologists will be familiar with it. Contains material from many sources: literary analysis, archeology, history and comparative mythology to explain Bible stories that do not make sense when taken literally. Addresses: why is the bible so repetitive and contradictory?; what was ancient Egypt's influence on Christianity?: Is there evidence for the Exodus or Joshua's conquest of Canaan?; What Bible stories were derived from earlier tales?; What ancient myths influenced the Nativity, Passion, and Resurrection narratives?; did the Israelites worship other deities? A great reference book.

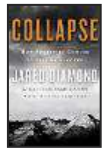
Jared Diamond



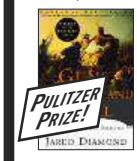
The Third Chimpanzee: The Evolution and Future of the Human Animal by Jared Diamond (b049PB $15. paperback) The evolution of human sexuality and science of adultery. How we pick our mates and sex partners. Why do we grow old and die? The animal origins of art. Why do we smoke, drink, and use dangerous drugs? The golden age that never was.



Natural Experiments in History (b138HB $29.95 hardback) Edited by Jared Diamond and James Robinson. You can't run a controlled scientific experiment to discover the economic consequences of military conquest or slavery. But you can use comparative statistics from closely related societies to discover surprising reasons for far-reaching historical outcomes. Why is Haiti, which shares an island with the Dominican Republic, so much poorer? Why did deforestation occur on some Pacific islands and not others? Why did places conquered by Napoleon become wealthier than those that were not? Also: world banking systems, India, the New World.

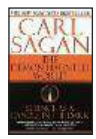


Collapse: How Societies Choose to Fail or Succeed by Jared Diamond. (88PB $18. paperback) What caused some of the great civilizations of the past to collapse into ruin, and what can we learn from their fates? Diamond traces the fundamental patterns of social catastrophe.



Guns, Germs and Steel by Jared Diamond (b054PB $15.95 paperback) Why did Eurasians conquer Native Americans, Australians, & Africans, instead of the reverse? Diamond dismisses racially-based theories of human history by revealing the environmental factors responsible for history's broadest patterns. A work rich in dramatic revelations that challenges conventional wisdom.

Carl Sagan



The Demon-Haunted World (b045PB $15.95 paperback) by Carl Sagan. The great astronomer and science writer challenges New Agers & explains social phenomena like UFOs, alien abductions, recovered memories, satanic cults, witch crazes, hallucinations. How to detect baloney. A classic!

The Varieties of Scientific Experience: A Personal View of the Search for God by Carl Sagan, Ed. by Ann Druyan. (B114PB $17. paperback) Sagan's prestigious Gifford Lectures on Natural Theology. Considers: psychology of belief; possible chemical nature of transcendence; creationism & intelligent design; life on other planets; science as "informed worship." Humorous, wise, and at times stunningly prophetic. Sagan at his best.

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This 16-page booklet is designed to hone critical thinking skills. What questions to ask, what traps to avoid. Specific examples of how the scientific method is used to test pseudoscience and paranormal claims. Includes a how-to guide in developing a class in critical thinking. Includes: Sagan's Ten Tools for Baloney Detection; Shermer's Ten Questions For Baloney Detection; How Thinking Goes Wrong: The 25 Fallacies of Thought; Eight Sample Syllabi: How to Teach a Course in Science & Pseudoscience; Most Recommended Skeptical Books; Skeptical Manifesto. Baloney Detection Kit. Cat. No. PB075 16 pages, 8 ½ x 11 booklet.

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A Skeptic's Guide To Global Climate Change by Don Prothoro (148PB $5. paperback) See skeptic.com for multiple copy discounts) The Scientific Background & Evidence for Climate Change; M. Shermer on why he changed his mind; Skepticism v. Denialism; Answers to 25 Climate Denier Arguments; Are We the Cause?; Forces Behind Science Denialism; A Skeptical Scientist Looks at Climate Data; Consequences. 28 pages 8 1/2 x 11 inches.

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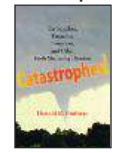
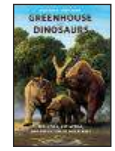
Don Prothero

Reality Check by Don Prothoro (b151HB $35. hardback) Describes how major scientific ideas that are accepted by the entire scientific community (evolution, anthropogenic global warming, vaccination, the HIV cause of AIDS, and others) have been attacked with totally unscientific arguments and methods, and argues that science denial has resulted in widespread scientific ignorance, increased risk of global catastrophes, and deaths from disease.

Catastrophes! Earthquakes, Tsunamis, Tornadoes, and Other Earth-Shattering Disasters (b147HB $30. hardback) A fascinating read. Describes historic catastrophic events and the forces that cause them in gripping detail. These tales of geologic history and human fortitude & folly will stay with you long after you put the book down & leave you with respect for the mighty power of the earth.

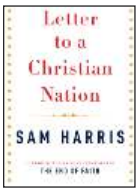




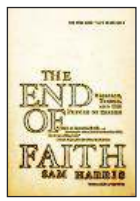
Greenhouse of the Dinosaurs: Evolution, Extinction, and the Future of Our Planet (b137HB $29.95 hardback) Dr. Donald Prothero discusses the latest findings and controversies in geology and paleontology, using a personal narrative style and examples from his own career. A must read for anyone interested in these professions. A section of the book covers the possible reasons for past radical climate changes and extinctions—from jungles in the Arctic to the frozen snowball earth—and what this could mean for us and our current changing climate.

Evolution: What the Fossils Say and Why It Matters by Donald Prothero. (b127HB $30. hardback) Rave reviews! "Best damn evolution book, period!" A great introduction to the field or get up to speed on the latest discoveries in the incredibly rich fossil record, with an emphasis on transitional forms. Includes a no holds barred critique of the claims of creationism and Intelligent Design. Over 200 illustrations.

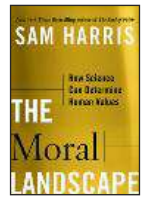
Sam Harris



Letter to a Christian Nation by Sam Harris. (b140HB $12. hardback) In this tightly reasoned commentary on the state of religion in America, Sam Harris pulls no punches in his arguments to members of the Christian Right on all matters moral and political, noting Old Testament law (death for adultery, homosexuality, disobedience to parents etc.), and contrasts this with, for example, the complete non-violence of Jainism. Harris argues that the reliance on dogma can create a false morality, which is divorced from the reality of human suffering and the efforts to alleviate it. Quite a bargain for only $12.

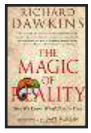


The End Of Faith: Religion, Terror, and the Future of Reason by Sam Harris. (b139PB $13.95 paperback). Harris' first book was an instant bestseller because of its cogent arguments & literary clarity, in which the author argues that because of weapons of mass destruction the world can no longer tolerate violent religions, & that in fact even moderate religious believers only encourage extremists by enabling their supernatural beliefs.

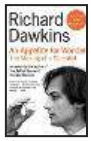


The Moral Landscape: How Science Can Determine Human Values by Sam Harris. (b141HB $26.95 hardback) Views the experiences of conscious creatures as peaks and valleys on a "moral landscape." Definite facts can be known about where we fall on this landscape, so science can go beyond merely describing morality—it should be able to tell us what we ought to do to live the best lives possible.

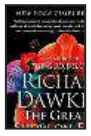
Richard Dawkins



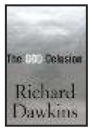
***The Magic of Reality: How We Know What's Really True* by Richard Dawkins**
For years people have wanted the renowned evolutionary biologist to write a book for kids on evolution. He has done that—and much more—with this highly engaging and well-illustrated work that will also enlighten adults who read it. Filled with clever thought experiments and jaw-dropping facts, The Magic of Reality explains a stunningly wide range of natural phenomena. This is a page-turning detective story that not only mines all the sciences for its clues but primes the reader to think like a scientist as well. **Cat. No. b166PB ($16. paperback)**



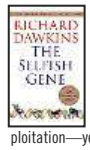
An Appetite for Wonder: The Making of a Scientist
by Richard Dawkins. Cat.No.b167PB. ($15.99 paperback) A memoir covering material from Dawkins' childhood in colonial East Africa through the publication of his world-changing bestselling book *The Selfish Gene*. Told with frankness and eloquence, warmth and humor. An entertaining and enlightening read.



The Greatest Show on Earth by Richard Dawkins. (b143PB $16.99 paperback) A fierce counterattack against Intelligent Design. Rich layers of scientific evidence: living examples of natural selection; fossils; natural clocks; developing embryos; plate tectonics; molecular genetics—all make an airtight case for evolution by non-random selection. A master vision of life's splendor.

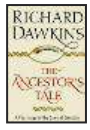


The God Delusion by Richard Dawkins. (B113PB $15.95 paperback) Dawkins' most important book to date, his definitive statement on the God question, the origins of morality & religion, the best arguments for and against God's existence, the dangers of religious extremism, and why science offers the best hope for humanity.



The Selfish Gene A Classic!
by Richard Dawkins. (b123PB $15.95 paperback) Changed the nature of the study of social biology. This brilliant reformulation of the theory of natural selection explains how the selfish gene revolves around savage competition and exploitation—yet acts of apparent altruism do exist in nature.

The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe Without Design by Richard Dawkins. (b087PB $15.95 paperback) Perhaps the most influential work on evolution written in this century. Natural selection—the unconscious, automatic, blind, yet essentially nonrandom process—has no purpose in mind. If it can be said to play the role of watchmaker in nature, it is the blind watchmaker. Engaging and accessible.
Award Winner!



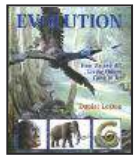
The Ancestor's Tale by Richard Dawkins. (b092PB $16.95 paperback) A masterwork: an exhilarating reverse tour through evolution, from present-day humans back to the microbial beginnings of life. Entertaining, insightful stories. Sheds light on topics such as speciation, sexual selection, and extinction. An essential education in evolutionary theory and a riveting read.

A Devil's Chaplin by Richard Dawkins. (b122PB $14.paperback) Diverse topics examined through the lens of natural selection: education, ape rights, jury trials, the vindication of Darwinism; memes; religion, academic obscurantism; Stephen Jay Gould; Douglas Adams; pseudoscience; & his awe at the marvelous complexity of the universe. Written with clarity & passion.

Climbing Mount Improbable by Richard Dawkins. (b121PB $16.95. paperback) The Mount Improbable metaphor symbolizes the improbability that seemingly perfectly designed living things evolved. In a breathtaking journey through the mountain's passes and up its many peaks, Dawkins shows how the improbable path to perfection merely takes time.

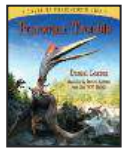
MULTI-AWARD WINNING CHILDREN'S BOOKS

Daniel Loxton



Evolution: How We and All Living Things Came to Be
by Daniel Loxton. (b136HB $18.95) Ages 8–13. Winner of multiple awards. Easy to understand, spectacularly illustrated introduction to the theory of evolution. How the evidence for evolution was discovered, the basic mechanics of how it works. Answers to common questions and misunderstandings about evolution. Written with warmth and enthusiasm. Outstanding science content.

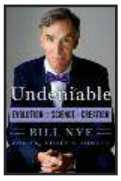
Ankylosaur Attack (Tales of Prehistoric Life) by Daniel Loxton. (b145HB $16.95) Ages 4 and up. A mind-blowing feast for the eye that uses photorealistic images along with an exciting, natural history-inspired story. Pre-school children will enjoy a story that features a young hero. A young ankylosaur (a plant-eating, heavy-plated dinosaur) saves the day when a T. rex attacks. A surefire hit with young dinosaur lovers.



Pterosaur Trouble (Tales of Prehistoric Life)
by Daniel Loxton. (b149HB $16.95) Ages 4 and up. A dramatic paleofiction tale inspired by real fossil discoveries. The mighty pterosaur Quetzalcoatlus—perhaps the largest flying animal ever to exist—finds himself on the menu for a pack of small feathered Velociraptor-like dinosaurs. This photorealistic adventure will delight and astonish.

Plesiosaur Peril (Tales of Prehistoric Life)
by Daniel Loxton. (b153HB $16.95) Ages 4 and up. A group of plesiosaurs, ocean-dwelling cousins of the dinosaurs, keeps safe by swimming in a family pod. But when one baby plesiosaur swims too far from its mother it attracts the attention of something large and very hungry and the struggle for survival is on.

***Do You Believe in Magic? Vitamins, Supplements, and All Things Natural* by Paul A. Offit, M.D.** Medical expert Offit offers a scathing exposé of the alternative medicine industry, revealing how even though some popular therapies are remarkably helpful due to the placebo response, many of them are ineffective, expensive, and even deadly. He concludes: "There's no such thing as alternative medicine. There's only medicine that works and medicine that doesn't."
Cat. No. b156PB ($15.99 paperback)



***Undeniable: Evolution and the Science of Creation* by Bill Nye.** Sparked by his 2014 debate with Creation Museum curator Ken Ham, Bill Nye expands the points he made about creationism and points out that this debate is not so much about religion v. science as about the nature of science itself. With infectious enthusiasm, he reveals the mechanics of evolutionary theory, and explains how it is rooted in the testable and verifiable scientific method. He argues passionately that to continue to assert otherwise, to continue to insist that creationism has a place in the science classroom is harmful not only to our children, but to the future of the greater world as well.is misguided—and potentially dangerous. **Cat. No. b163HB ($25.99 HB)**

Daniel C. Dennett

Darwin's Dangerous Idea: Evolution and the Meanings of Life by Daniel C. Dennett. Both groundbreaking and accessible. Focuses unerring logic on the theory of natural selection, showing how Darwin's great idea transforms and illuminates our traditional view of humanity's place in the universe. Dennett vividly describes the theory itself and then extends Darwin's vision with impeccable arguments to their often surprising conclusions, challenging the views of some of the most famous scientists of our day, including Stephen Jay Gould.
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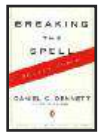
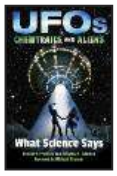
1995 National Book Award Finalist



Breaking the Spell: Religion as a Natural Phenomenon by Daniel C. Dennett. In this definitive work on religion by one of the "Four Horsemen" and world-famous philosopher Daniel Dennett asks "Is religion a product of blind evolutionary instinct or rational choice?" "Is it truly the best way to live a moral life?" Ranging through biology, history, and psychology, Dennett charts religion's evolution from "wild" folk belief to "domesticated" dogma.
Cat. No. b154PB. ($18. paperback)
NEW YORK TIMES BESTSELLER

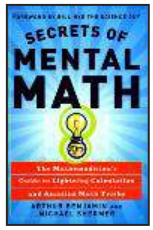


UFOs, Chemtrails, and Aliens: What Science Says
Award Winners!
(b171HB $28.00) Donald R. Prothero and Tim Callahan
Explores why demonstrably false beliefs—UFOs. Aliens. Strange crop circles— thrive despite decades of education and scientific debunking. Employs the ground rules of science and the standards of scientific evidence and discusses a wide range of topics including the reliability of eyewitness testimony, psychological research into why people want to believe in aliens and UFOs, and the role conspiratorial thinking plays in UFO culture. Callahan and Prothero examine a variety of UFO sightings and describe the standards of evidence used to determine whether UFOs are actual alien spacecraft. Finally, they consider our views of aliens and the strong cultural signals that provide the shapes and behaviors of these beings. While their approach is firmly based in science, the authors also share their personal experiences of Area 51, Roswell, and other legendary sites, creating a narrative that is sure to engross both skeptics and believers.

Abominable Science!: Origins of the Yeti, Nessie, and Other Famous Cryptids by Daniel Loxton and Donald Prothero. (b150HB $29.95 hardback) An entertaining, educational, and definitive text on cryptids, presenting the arguments both for and against their existence. Takes on Bigfoot; the Yeti, or Abominable Snowman, and its cross-cultural incarnations; the Loch Ness monster; the evolution of the Great Sea Serpent; and Mokele Mbembe, the Congo dinosaur. Analyses the psychology behind the persistent belief in paranormal phenomena, and discusses the cryptozoology subculture.

CHILDREN'S BOOKS

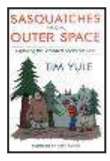
Secrets of Mental Math: The Mathemagician's Guide to Lightning Calculation and Amazing Math Tricks (12 to adult.) (b112PB $12.95) By Arthur Benjamin & Michael Shermer. Renowned "mathemagician" Benjamin shares his secrets for lightning-quick calculations & amazing number tricks. Learn to do math in your head faster than you ever thought possible & make math fun.



Test Your Science IQ
by Charles Cazeau (b073PB $20.00, 368 pages. paperback. 12 to adult) Hundreds of addictive questions & answers covering both science & pseudoscience. Clear, well written, yet sophisticated enough for adults. Very strong on why science is important. A book you will enjoy experiencing with your child. Fascinating and fun.

The Magic Detectives
Written and illustrated by Joe Nickell (b070PB $15. 115 pages. Paperback. 9 to 14 yrs) 30 mysteries—encourages readers to think for themselves before the solution is offered. Historical ghost incidents, Lock Ness, UFO aliens, Mummy's Curse, Holy Shroud, and more.

Maybe Yes, Maybe No
by Dan Barker (b071PB $16.00, 128 pages. paperback.7-10 years) Adventures of Andrea, a skeptic. Cartoon strip style. How to check out extraordinary claims. Simple straightforward text. How to listen and ask questions; how to seek a simple explanation; what tools and rules a scientist uses to check things out.



Sasquatches From Outer Space
by Tim Yule. (Ages 10-15) (b072PB $15.) Chatty cheerful style. Covers Astrology, bigfoot, ESP, the Bermuda triangle, corp circles, Loch Ness Monster, Vampires, and UFOs and aliens. Glossary, bibliography. "Try This" sections encourage critical thinking skills.

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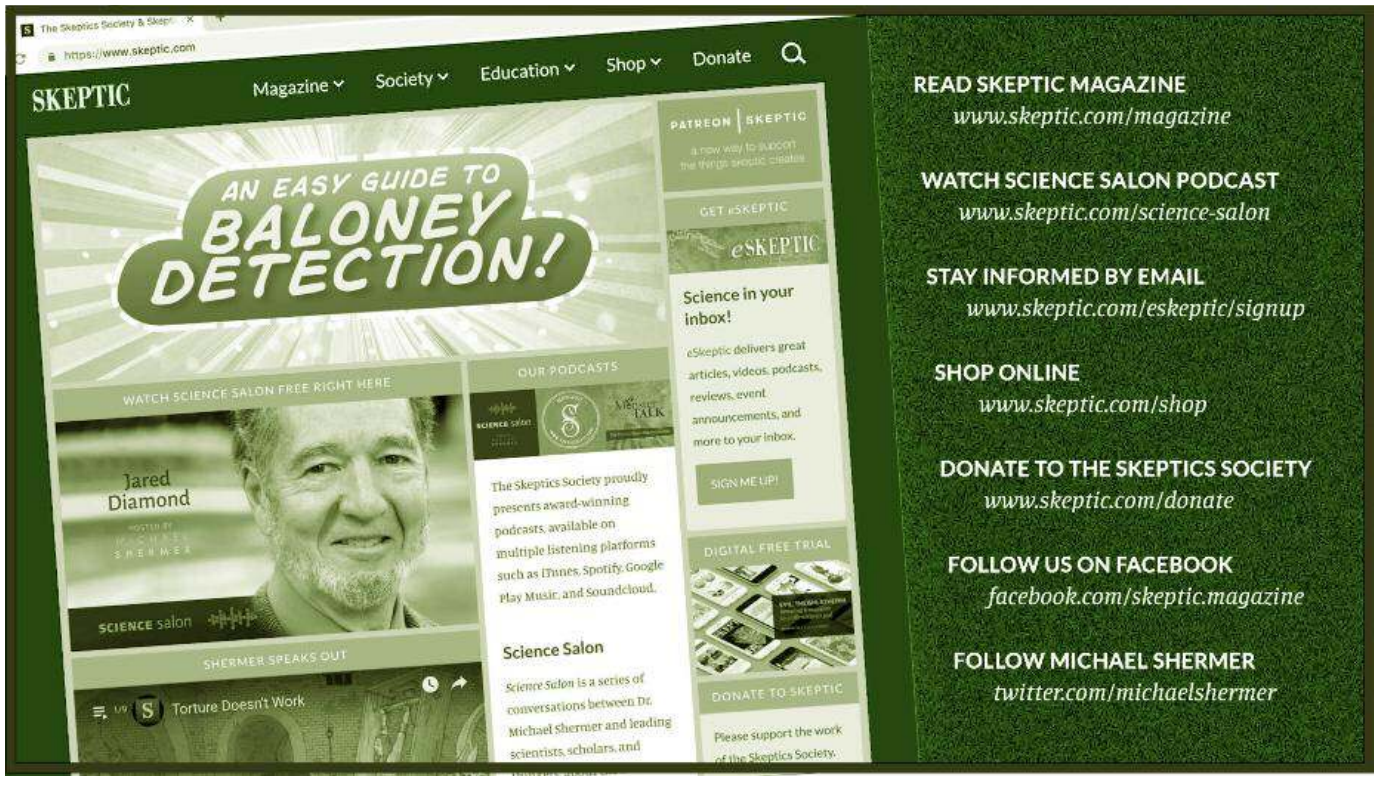

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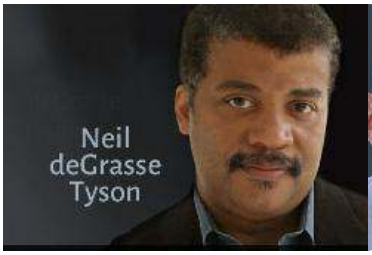
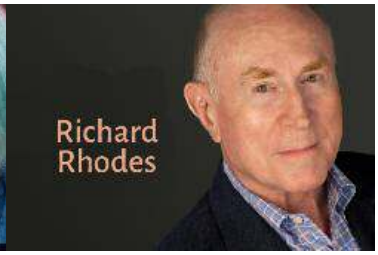




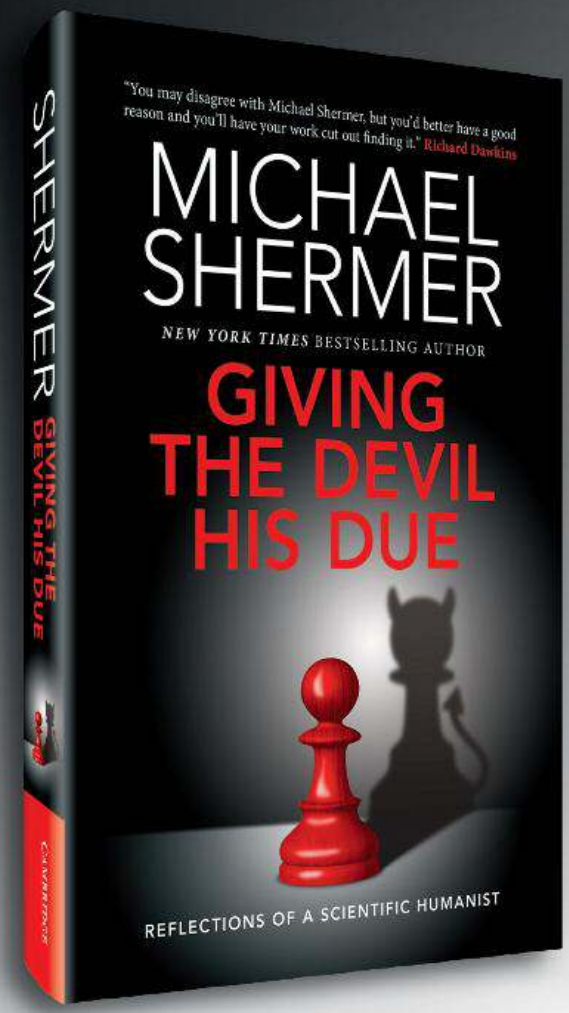
More salons are listed on the inside front cover.

GIVING THE DEVIL HIS DUE

MICHAEL SHERMER

Who is the 'Devil'? And what is he due? The Devil is anyone who disagrees with you. And what he is due is the right to speak his mind. He must have this for your own safety's sake because his freedom is inextricably tied to your own. If he can be censored, why shouldn't you be censored? If we put barriers up to silence 'unpleasant' ideas, what's to stop the silencing of any discussion?

This book is a full-throated defense of free speech and open inquiry in politics, science, and culture by the New York Times bestselling author and skeptic Michael Shermer. The new collection of essays and articles takes the Devil by the horns by tackling five key themes: free thought and free speech, politics and society, scientific humanism, religion, and the ideas of controversial intellectuals. For our own sake, we must give the Devil his due.


"You may disagree with Michael Shermer, but you'd better have a good reason and you'll have your work cut out finding it." Richard Dawkins
MICHAEL SHERMER
NEW YORK TIMES BESTSELLING AUTHOR
GIVING THE DEVIL HIS DUE
REFLECTIONS OF A SCIENTIFIC HUMANIST
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